

**REPORT OF FINDINGS AND
RESPONSE PLAN
22958 Saklan Road
Hayward, California**

April 2006

Prepared for

La Vista, LLC
11555 Dublin Boulevard
Dublin, California 94568

Prepared by

WEST

Environmental Services & Technology

711 Grand Avenue, Suite 220
San Rafael, California 94901
415/460-6770 Fax 415/460-6771
main@westenvironmental.com

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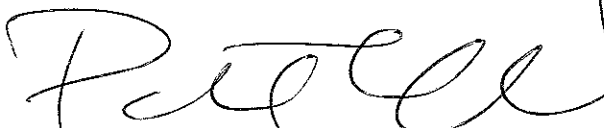
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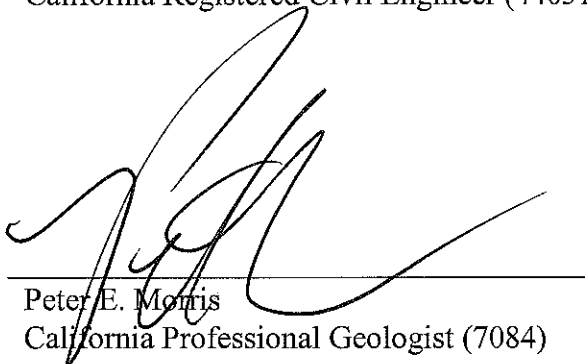
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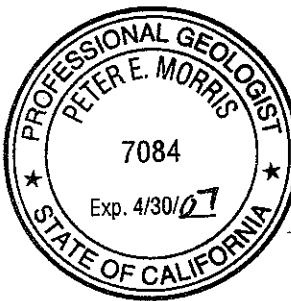
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All engineering information, conclusions and recommendations contained in this report have been prepared by a California Professional Engineer. All hydrogeologic and geologic information, conclusions and recommendations contained in this report have been prepared by a California Professional Geologist.


Peter M. Krasnoff
California Registered Civil Engineer (44031)


4/27/06
Date


Peter E. Morris
California Professional Geologist (7084)


4/27/06
Date

1.0 INTRODUCTION

This *Report of Findings and Response Plan* (“*Response Plan*”) has been prepared by West Environmental Services & Technology, Inc., (WEST) for the property located at 22958 Saklan Road, Hayward, California (“*Site*,” Figure 1-1). This *Response Plan* presents: a summary of the results of the Site investigations; a Conceptual Site Model (CSM); a summary of response actions to be conducted; and the response schedule.

The Site is being addressed under the California Land Use and Revitalization Act (CLRRA), which provides immunity from liability for response costs or damage claims to qualified innocent landowners, bona fide purchasers or contiguous property owners. The CLRRA agreement for the Site was entered into between La Vista, LLC and the Department of Toxic Substances and Control (DTSC) on December 21, 2005. This *Response Plan* presents the findings of soil, soil gas and groundwater investigations conducted at the Site pursuant to the *Site Assessment Work Plan* (“*Work Plan*,” WEST, 2006). The Task 3: Passive Soil Gas Sampling portions of the *Work Plan* were approved by of the DTSC on January 19, 2006; the remainder of the *Work Plan* was approved by the DTSC on February 3, 2006.

Regulatory and technical guidance documents used in preparation of this *Response Plan* included: *California Health and Safety Code* §25395.96; the *Sampling and Analysis Plan Guidance* (USEPA, 1997); *Guidelines for Hydrogeologic Characterization of Hazardous Substance Release Sites, Volume 1: Field Investigation Manual*; and *Volume 2: Project Management Manual* (CalEPA, 1995a,b).

1.1 BACKGROUND

The property was grassland before the 1950s. A pickle processing facility operated at the Site between the 1950s and 2004. A Phase I Environmental Site Assessment (Phase I ESA) was conducted in 2005 to identify known and suspect recognized environmental conditions associated with historical Site use. The Phase I ESA revealed recognized environmental conditions including: historical use of the property as agricultural land; pickle processing

facilities; wastewater treatment and disposal; machine repair and maintenance; and potential offsite sources of hazardous substances (WEST, 2005).

In March 2005, a Phase II Environmental Site Assessment (Phase II ESA) was conducted to characterize the known and suspect recognized environmental conditions identified during the Phase I ESA. The Phase II ESA included the collection of: soil, soil gas and groundwater samples. The Phase II ESA revealed: the presence of petroleum hydrocarbons; organochlorine pesticides and metals and metalloids (herein jointly referred to as metals) in soil; and volatile organic compounds (VOCs) in soil gas and groundwater (WEST, 2006a).

In January 2006, a *Work Plan* was submitted to DTSC, presenting: a summary of the Phase II ESA investigations; a CSM that explained the nature and distribution of chemicals at the Site; and a data gap analysis. Preliminary Remedial Goals (PRGs) for the protection of human health and the environment, based on the future land use as residential, were developed as part of the *Work Plan* to assess the Phase II ESA findings.

The comparison of the Phase II ESA findings with the PRGs revealed that soil containing organochlorine pesticides and metals did not pose an unacceptable human health risk for future residents. However, the results of the analysis revealed that: total petroleum hydrocarbons (TPH) were present in soil above resource protection criteria; VOCs were present in soil gas above applicable screening levels; and VOCs were present in groundwater above numerical water quality objectives. A field sampling plan was developed to address the identified data gaps, which included characterizing the lateral and vertical distribution of the chemicals identified above their PRGs.

Between January and March 2006, the *Work Plan* was implemented to address the identified data gaps. The investigations included: passive soil gas sampling; soil sampling; active soil gas sampling; and groundwater sampling. This *Response Plan* was prepared to summarize the Site investigation findings; document that the identified data gaps have been addressed; and select the required response actions to be conducted at the Site for future residential land use.

Pursuant to the CLRRRA agreement for the Site, the proposed response actions include: excavation and offsite disposal of approximately 600 cubic yards of soil containing TPH, tetrachloroethene (PCE) and 1,4-dioxane; abandonment of the onsite water supply well; implementation of institutional controls and groundwater sampling to monitor the offsite contribution of PCE in groundwater. The implementation procedures and schedule for the response actions are detailed in Section 5.0.

1.2 REPORT ORGANIZATION

The *Response Plan* is organized as follows:

- Site Description (Section 2.0);
- Summary of Investigations (Section 3.0);
- Data Evaluation (Section 4.0); and
- Response Plan Implementation (Section 5.0).

2.0 SITE DESCRIPTION

The approximately 3.5-acre Site is located north of North Lane and east of Saklan Road in Hayward, California (Figure 1-1). The Assessor's Parcel Numbers for the Site are 441-003-012, -013, -014 and -015. Physical structures at the Site include: outdoor paved areas; open concrete-lined wastewater conveyance trenches; warehouse and pickle processing buildings; cucumber receiving and washing area; a boiler house; a wash rack and a wastewater treatment pit.

The Site is relatively flat with an approximate elevation of 40 feet above Mean Sea Level (MSL). Surface elevations are approximately level with Saklan Road and approximately three feet higher than North Avenue.

2.1 REGIONAL GEOLOGIC AND HYDROGEOLOGIC SETTING

The Site is located within the San Leandro-San Lorenzo Cones near the eastern edge of the San Francisco Bay as part of the Coast Ranges Geomorphic Province. The San Leandro-San Lorenzo Cones are composed of interbedded unconsolidated Younger Alluvial Fan stream channel deposits composed of silts, clays and sands (Norfleet, 1998). The alluvial fan deposits are coarser-grained to the east near the Hayward Fault and grade to medium- to fine-grained material near the eastern edge of the San Francisco Bay.

The Younger Alluvial Fan deposits extend northwest towards Richmond. The western boundary of the San Leandro-San Lorenzo Cones are interfingered along the eastern edge of the San Francisco Bay with the Younger Bay Mud, San Antonio Formation and the Yerba Buena Mud of the Alameda Formation. The Alameda Formation is underlain by floodplain, lake and alluvial deposits of the Santa Clara Formation. The underlying Franciscan Basement bedrock is composed of mélangé, serpentine and ultramafic rocks of the Franciscan Complex and shale, sandstone and conglomerates of the Great Valley Sequence. The Hayward Fault is located approximately three miles to the east of the Site (Regional Board, 1999).

Groundwater near the Site is present within the San Leandro and San Lorenzo Sub-Areas of the East Bay Groundwater Basin (Regional Board, 1999). Two aquifers, shallow and deep, are within the San Leandro and San Lorenzo Sub-Areas. The shallow aquifer extends from approximately ground surface near the eastern edge of the San Francisco Bay to depths of approximately 200 feet below ground surface. The deep aquifer is present below the shallow aquifer at depths of approximately 200 feet and deeper. The shallow and deep aquifers are composed of fine- to medium-grained alluvial fan materials, which are divided by an aquitard approximately 50 feet to 100 feet in thickness, and similar in composition to the Yerba Buena Mud. The aquifers reportedly produce less water than the Niles Cone Sub-Area to the south (Regional Board, 1999). Production wells within the San Leandro Sub-Area pump groundwater mainly from the shallow aquifer, whereas production wells in the San Lorenzo Sub-Area pump from the deep aquifer. The Newark, Centerville, Fremont and Deeper Aquifers are present west of the San Leandro-San Lorenzo Sub-Areas below the San Francisco Bay.

2.2 SITE GEOLOGY AND HYDROGEOLOGY

The Site is composed primarily of unconsolidated alluvial deposits. Unconsolidated alluvial deposits composed of silts, clays and sands underlie the Site to a depth of approximately 27 feet below ground surface. Groundwater beneath the Site was encountered at depths of approximately 16 feet and 19 feet below ground surface. The groundwater flow gradient during March 2006 was calculated at 0.004 feet per foot to the west toward the San Francisco Bay (Figure 2-1). A copy of the boring logs is included in Appendix B.

A water supply well is located onsite. The depth of the water supply well was measured at approximately 100 feet below ground surface. The depth to groundwater in the water supply well was measured at approximately 17 feet below ground surface.

2.3 SURFACE WATER

Sulphur Creek, which flows to the San Francisco Bay, is located approximately 5,000 feet to the northwest. Saltwater evaporation ponds and the San Francisco Bay are located approximately 9,000 feet to the west.

2.4 HISTORICAL SITE USE

Prior to development, grass was present on the Site (Figure 2-2). In the 1950s, the Site was developed as a pickle and relish processing facility on the northwest portion of the Site (EDR, 2005). A low-lying area was observed on the eastern quarter of the Site in a 1965 historical aerial photograph (EDR, 2005). Between the 1960s and 1980s, the pickle processing facility was expanded: to the south with the addition of a warehouse building; to the east with the addition of a machine shop; and over the low-lying areas to the east with concrete pavement (EDR, 2005; Figure 2-2). In 2004, the pickle processing facility was closed.

The pickle processing operations included: cucumber washing and sorting; cucumber brining; pickle and relish packing; warehousing and distribution; and brine wastewater treatment. Cucumbers were transported to the south gate, sorted and then washed to remove residual soil prior to sorting. Wastewater from the cucumber washing was conveyed via the onsite wastewater collection system to a solids separator prior to discharge to the sanitary sewer (Figure 2-2). Following sorting and washing, the cucumbers were stored in approximately two hundred 10,000-gallon open-topped aboveground brine tanks. The aboveground brine tanks were located on concrete surfaces, east of the buildings. Brine wastewater was conveyed for treatment through six-inch deep concrete trenches and polyvinyl chloride (PVC) piping embedded in the concrete. The brine wastewater was pretreated using sodium hydroxide prior to discharge to the sanitary sewer.

Raw materials used during the pickle and relish processing included: calcium chloride; sodium chloride; potassium sorbate; sodium benzoate; distilled vinegar; and corn syrup (HFD, 2005). A boiler, used onsite for steam generation, was operated using fuel oil and natural gas. Boiler scale

treatment chemicals were stored in a 55-gallon drum. The machine shop was used for equipment maintenance. Chemicals stored in the machine shop included: oxyacetylene and argon gas cylinders for welding; paints; and solvents. An onsite six-inch diameter water supply well is located adjacent to the boiler house. Water from the supply well was used for onsite operations.

2.5 HISTORY AND USE OF ADJOINING PROPERTIES

The adjoining properties are and have been used for residential, commercial and industrial purposes (Figure 2-2). Commercial buildings are currently located to the north of the Site and south of West Winton Avenue. An automobile service business is located to the northeast of the Site. Further north of the Site, across West Winton Avenue, is the Hayward Executive Airport and Hayward Air National Guard facilities. To the east and south of the Site is residential and open land.

Historically, the land to the east, north and south, as well as to the northwest of the Site was used for agriculture between the 1930s and 1960s (Figure 2-2). Property to the west of the Site was open land until the 1980s when it was used as part of the pickle processing facility. Two residences were located to the northwest of the Site at the corners of West Winton Avenue and Saklan Road. The residences to the south and east of the Site were built in the 1960s on the former agricultural land.

A leaking waste oil underground storage tank (UST) was present at Superior Oil Change & Tune-up (1294 West Winton Avenue), located hydraulically upgradient approximately 500 feet to the northeast. Sampling in April 2002 at the Superior Oil Change and Tune-up revealed the presence of PCE in groundwater at 60 micrograms per liter ($\mu\text{g/l}$) (Geotracker, 2006). The waste oil UST was closed in June 2002 with oversight by the City of Hayward and by the California Regional Water Quality Control Board – San Francisco Bay Region (EDR, 2005). The source of the VOCs in groundwater was not addressed prior to closure of the waste oil UST.

3.0 SUMMARY OF INVESTIGATIONS

Investigations were conducted at the Site in March 2005 and from January to March in 2006. The investigation activities conducted in March 2005 included a Phase I ESA to identify the known and suspect recognized environmental conditions associated with historical Site use and a Phase II ESA investigation to characterize the known and suspected recognized conditions identified during the Phase I ESA. A Site Assessment investigation was conducted between January and March 2006 in accordance with WEST's *Work Plan* (WEST, 2006a) to characterize the lateral and vertical extent of the chemicals of potential concern (COPCs) identified in the Phase II ESA. The Site investigation activities included: soil, soil gas and groundwater sampling. A summary of the investigations is presented below.

3.1 PHASE I ENVIRONMENTAL SITE ASSESSMENT

A Phase I ESA was conducted by WEST in 2005 (WEST, 2005). The Phase I ESA included: a review of reasonably ascertainable regulatory databases and historical records; Site reconnaissance; and interviews with individuals with knowledge regarding past uses of the Site. The Phase I ESA was conducted to identify the presence of hazardous substances and petroleum products under conditions that indicate an existing release, a past release or a material threat of a release. Based on the information obtained from the Phase I ESA, suspect and known recognized environmental conditions were identified, including:

- Potential releases of pesticides from historical onsite agricultural operations;
- The potential presence of hazardous substances and petroleum products in materials used to fill the low lying areas on the Site;
- Potential releases of hazardous substances associated with equipment maintenance near the machine shop;
- Potential releases of wastewater from onsite treatment and sewer leaks;

- Potential releases of petroleum products from operation of the boiler; and
- Potential contributions of hazardous substances and petroleum hydrocarbons from offsite groundwater migration.

3.2 PHASE II ENVIRONMENTAL SITE ASSESSMENT - 2005

In March 2005, a Phase II ESA was conducted at the Site to characterize the nature of the known and suspect recognized environmental conditions identified during the Phase I ESA. The Phase II ESA included advancement of: 13 borings (W-1 to W-10, W-13, W-15 and W-16) for the collection of soil samples; 9 borings (W-1, W-2, W-7 to W-12 and W-17) for the collection of soil gas samples; and five borings (W-1, W-7, W-9, W-11 and W-12) for the collection of groundwater samples. In addition, a groundwater sample was collected from the existing onsite water supply well (W-15). The Phase II ESA laboratory analytical results were presented in the *Work Plan*.

The soil and soil gas samples were collected (at depths of approximately one-foot and three-feet below ground surface, respectively) in the vicinity of areas with the potential for an existing release, a past release or a material threat of a release. Groundwater samples were collected from temporary borings (at approximately 18 feet below ground surface) and the onsite water supply well (at approximately 20 feet below ground surface) to characterize the nature and extent of COPCs in groundwater. A summary of the soil, soil gas and groundwater sample collection methodologies and analytical results is presented below. Summaries of the analytical results are also included in Tables 3-1 to 3-4 and depicted on Figures 3-1 to 3-3.

3.2.1 Soil Sampling

Thirteen soil samples were collected from borings, W-1 to W-10, W-13, W-15 and W-16, at approximately 6-inches below the one-half foot to one-and-a-half foot thick concrete paved surface at the Site. A summary of the analytical results for the soil samples is included in Tables 3-1 and 3-2 and depicted on Figure 3-1.

3.2.1.1 PETROLEUM HYDROCARBONS IN SOIL

Nine of the 13 soil samples (W-2 to W-6, W-10, W-13 to W-14 and W-16) were analyzed for total petroleum hydrocarbons (TPH) as diesel (TPHd), and gasoline (TPHg). Laboratory analysis of the soil samples revealed TPHd at: 849 milligrams per kilogram (mg/kg) in the soil sample collected adjacent to the wash rack pad (W-13); and at 184 mg/kg in the soil sample collected near a drop inlet located approximately 40 feet east of the loading dock (W-10).

Laboratory analysis also revealed TPHd in soil samples collected: in the cucumber tank yard (W-6 at 20.3 mg/kg); filled low-lying area (W-2 at 10.5 mg/kg); and adjacent to the boiler room (W-14 at 10.2 mg/kg). Laboratory analysis of the soil samples did not reveal TPHd above the laboratory-reporting limit of 10.0 mg/kg in samples W-3 to W-5 and W-16. Laboratory analysis of the soil samples did not reveal TPHg above the laboratory-reporting limit of 1.0 mg/kg.

3.2.1.2 PESTICIDES AND POLYCHLORINATED BIPHENYLS IN SOIL

Twelve soil samples, W-1 to W-7, W-9 to W-10, W-13, W-15 and W-16, were analyzed for the organochlorine pesticide chlordane, total DDT [composed of dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethane (DDD) and dichlorodiphenyldichloroethene (DDE)] and polychlorinated biphenyls (PCBs). The soil samples were collected to characterize potential releases of pesticides from historical agricultural operations and PCBs in fill materials.

Laboratory analysis of the soil samples did not reveal chlordane above the laboratory-reporting limit of 50 micrograms per kilogram ($\mu\text{g/kg}$), with the exception of soil sample, W-1, collected in the northeast corner of the Site ($93.0 \mu\text{g/kg}$). Laboratory analysis of the soil samples did not reveal DDT above the laboratory-reporting limit of $10.0 \mu\text{g/kg}$, with the exception of: $74.4 \mu\text{g/kg}$ and $21.2 \mu\text{g/kg}$ reported in the soil samples collected at W-5 and W-9, respectively, located adjacent to concrete trenches used for conveying brine wastewater; and $10.7 \mu\text{g/kg}$ in the soil sample W-13, collected adjacent to the wash rack pad. Laboratory analysis did not reveal PCBs above the laboratory-reporting limit of $100 \mu\text{g/kg}$.

3.2.1.3 METALS AND pH IN SOIL

Thirteen soil samples (W-1 to W-10, W-13, W-15 and W-16) were analyzed for metals and pH to assess potential releases from historical onsite agricultural and pickling operations (Table 3-2). Laboratory analysis of the soil samples revealed lead above the laboratory-reporting limit of 2.5 mg/kg in 12 of the 13 soil samples collected at the Site. The lead concentrations in soil ranged from 2.5 mg/kg (W-10) to 155 mg/kg (W-8). The next highest concentration below 155 mg/kg was 76.5 mg/kg (W-16). The 95 percent UCL of the mean for lead in soil was calculated at approximately 50 mg/kg.

The lowest pH in soil samples was reported at 7.66 standard units (S.U) in the sample collected adjacent to a concrete trench used for conveying brine wastewater (W-9). The highest pH in soil samples was reported at 8.9 S.U. in the sample collected approximately 40 feet east of the loading dock (W-10).

3.2.2 **Active Soil Gas Sampling**

Nine borings (W-1, W-2, W-7 to W-12 and W-17) were advanced at the Site for the collection of active soil gas samples. The active soil gas samples were collected at approximately three-feet below the concrete paved surface at the Site to characterize VOCs in soil gas in the vicinity of areas with the potential for: an existing release; a past release; or a material threat of a release. A summary of the active soil gas analytical results is included in Table 3-3 and depicted on Figure 3-2.

Laboratory analysis of the active soil gas samples revealed: PCE; trichloroethene (TCE); cis-1,2-dichloroethene (herein referred to as DCE); chloroethene (CE); 1,1,1-trichloroethane (TCA); 1,1-dichloroethane (DCA); 1,4-dioxane; trichloromethane (TCM); benzene; toluene and xylenes above laboratory analytical reporting limits (Table 3-3).

3.2.2.1 PCE IN SOIL GAS

Laboratory analysis of the active soil gas samples revealed the highest concentration of PCE at 172 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) in the sample collected from boring W-12, located near the sediment separator and sewer line in the northwest corner of the Site. PCE was also reported in active soil gas samples collected in: the northeast portion of the Site closest to the reported upgradient detection of PCE in groundwater (W-1 at $15.1 \mu\text{g}/\text{m}^3$); adjacent to the machine shop and wastewater treatment pit (W-8 at $22.0 \mu\text{g}/\text{m}^3$); in the vicinity of the loading dock (W-10 and W-11; up to $76.9 \mu\text{g}/\text{m}^3$); and in the vicinity of the machine shop (W-17 at $17.1 \mu\text{g}/\text{m}^3$).

3.2.2.2 1,4-DIOXANE IN SOIL GAS

Laboratory analysis revealed 1,4-dioxane above its laboratory-reporting limit of $7.21 \mu\text{g}/\text{m}^3$ in the active soil gas samples collected: west of the loading dock (W-11 at $4,370 \mu\text{g}/\text{m}^3$); near the sediment separator and sewer line in the northwest corner of the Site (W-12 at $232 \mu\text{g}/\text{m}^3$); and in the northern portion of the cucumber tank yard (W-7 at $76.6 \mu\text{g}/\text{m}^3$). Laboratory analysis did not reveal 1,4-dioxane above its laboratory-reporting limit of $7.21 \mu\text{g}/\text{m}^3$ in the remaining four soil gas sample locations (W-22, W-23, W-25 and W-28).

3.2.3 **Groundwater Sampling**

Groundwater samples were collected from temporary monitoring wells installed in borings (W-1, W-7, W-9, W-11 and W-12) advanced to approximately 20-feet below ground surface, to characterize the nature and extent of TPH and VOCs. Based on depth to water measurements collected in borings W-1 and W-9, the groundwater samples were collected from approximately 17-feet below ground surface. Continuous core samples from borings W-1 and W-9 were collected to approximately 20-feet below ground surface and logged (Appendix B). Continuous core samples were collected from W-11 and W-12 to approximately eight-feet below ground surface for the collection of soil samples and logged; these borings were not logged between 8- and 20-feet below ground surface.

The groundwater samples were collected using low-flow purge techniques (USEPA, 1996) and analyzed for TPHd, TPHg and VOCs, including 1,4-dioxane. Disposable polyethylene tubing was inserted into the temporary monitoring well casing to a depth corresponding to half the distance between the depth to water and the bottom of the screen, i.e., approximately 18 feet below the ground surface. A summary of the groundwater analytical results is included in Table 3-4 and depicted on Figure 3-3.

3.2.3.1 TPH IN GROUNDWATER

Laboratory analysis of the six groundwater samples did not reveal TPHd or TPHg above their laboratory-reporting limits of 0.050 milligrams per liter (mg/l). The groundwater samples for TPH analysis were collected from borings in: the northeast and upgradient portion of the Site (W-1); north-central portion of the Site (W-7); western portion of the Site near wash-rack and loading dock (W-11); in the northwest portion of the Site along the sewer line (W-12); and from the onsite water supply well (W-15).

3.2.3.2 VOCs IN GROUNDWATER

Laboratory analysis of the groundwater samples revealed PCE in the hydraulically upgradient temporary monitoring wells, W-1 (10.4 µg/l) and W-7 (14.9 µg/l). Laboratory analysis of the groundwater samples collected from the hydraulically downgradient temporary monitoring wells W-11 and W-12 revealed PCE at 20.6 µg/l and 23.2 µg/l, respectively. Laboratory analysis of groundwater sample, W-9, which had the lowest concentration of PCE at 1.07 µg/l, also revealed: TCE at 4.83 µg/l; DCE at 5.53 µg/l; and trans-1,2-DCE at 1.64 µg/l. VOCs were not detected in the samples from the onsite water supply well (W-15) above the laboratory-reporting limit of 0.5 µg/l.

3.2.4 **Water Supply Well Sampling**

One groundwater sample was collected from the 100-foot deep onsite water supply well (W-15) at approximately 20 feet below ground surface. As noted above, laboratory analysis of the

groundwater sample collected from W-15 did not reveal the presence of TPHg, TPHd or VOCs above their respective laboratory-reporting limits of 0.0500 mg/l, 0.050 mg/l and 0.500 µg/l, respectively. A summary of the analytical results is presented in Table 3-4 and depicted on Figure 3-3.

3.3 SITE ASSESSMENT - 2006

In January 2006, a *Work Plan* was submitted to DTSC. The onsite passive soil gas sampling portion of the *Work Plan* was approved by DTSC on January 19, 2006. The remainder of the *Work Plan* was approved by the DTSC on February 3, 2006. The *Work Plan* presented: a CSM that explained the nature and distribution of chemicals at the Site; developed PRGs for the protection of human health and the environment based on the future land use as residential; identified data gaps; and presented the proposed work to address the data gaps. The investigations proposed in the *Work Plan* were conducted between January and March of 2006.

Based on the data gap analysis, additional soil, soil gas and groundwater investigations were conducted to:

- Further characterize the nature and extent of VOCs in soil gas;
- Further characterize the nature and extent of VOCs in groundwater including: PCE, which was found above the drinking water Maximum Contaminant Levels (MCLs) of 5.0 µg/l;
- Characterize the lateral and vertical extent of TPHd in soil identified: adjacent to the wash rack (849 mg/kg at W-13); and near a drop inlet located approximately 40 feet east of the loading dock (184 mg/kg at W-10);
- Characterize the potential contribution of lead in soil from lead-based paint adjacent to pre-1975 structures;
- Confirm the presence of pesticides and metals in the filled low-lying area; and

- Characterize the hydrogeologic conditions, i.e., groundwater flow direction and gradient to assist in evaluating the potential for offsite contributions.

Passive soil gas sampling was conducted at the Site as screening tool to assess potential onsite source(s) of VOCs to groundwater. Based on the findings of the passive soil gas investigation, the location, depth and number of subsequent soil, soil gas and groundwater samples were finalized on February 28, 2006 with concurrence from DTSC staff. Summaries of the soil, soil gas and groundwater analytical results are presented in Tables 3-1 to 3-6 and depicted on Figures 3-1 to 3-3.

3.3.1 Preliminary Remedial Goals

Based on the identified exposure pathways, Preliminary Remedial Goals (PRGs) were developed for chemicals in soil, soil gas and groundwater (WEST, 2006a). Chemical specific PRGs were developed from: concentrations based on Applicable or Relevant and Appropriate Requirements (ARARs); To Be Considered (TBCs) criteria including published environmental screening criteria; and concentrations based on site-specific risk assessments.

Concentration-based ARARs for selection of PRGs included the California Department of Health Services (DHS) maximum contaminant levels (MCLs) and Regional Board Basin Plan numerical water quality objectives. TBCs for selection of PRGs included: USEPA Region IX PRGs; CalEPA California Human Health Screening Levels (CHHSLs); and the Office of Environmental Health Hazard Assessment (OEHHA) Public Health Goals (PHGs) and toxicity factors. Where concentration-based ARARs or TBCs were not available, PRGs were developed following procedures as outlined by the USEPA (USEPA, 2004). A summary of the selected PRGs is presented in Table 4-1.

3.3.2 Permitting, Utility Clearance and Health and Safety

Prior to subsurface investigations, boring and monitoring well permits were obtained from the Alameda County Public Works Department. Pursuant to California Assembly Bill AB 73,

Underground Services Alert (USA) was also contacted at least 48-hours prior to subsurface activities to mark the work areas for underground utilities at the Site. The work areas were also cleared for underground utilities by a private underground utility locator.

As required by the California Occupational Health and Safety Administration (CalOSHA) Title 8 §5192 *Hazardous Waste Operations and Emergency Response* and the U.S. Occupational Health and Safety Administration (OSHA) 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Responses*, a Site Health and Safety Plan (HASP) was prepared for use by WEST personnel and contractors while conducting the field sampling activities (WEST, 2006b). The HASP outlined measures to control worker exposure to TPH and VOCs in soil and/or groundwater.

3.3.3 Passive Soil Gas Sampling

Passive soil gas sampling was conducted at the Site as a screening tool to refine the number, location and depth of subsequent soil, soil gas and groundwater samples. Twenty-three passive soil gas samplers (P-1 to P-23) were installed at the Site on January 25, 2006 and retrieved after 21 days. The passive soil gas samplers were installed approximately 6-inches below the 6-inch foot to 8-inch thick concrete paved surface at the Site. The sample locations were selected to identify potential onsite sources of VOCs resulting from historical chemical use: near the pickle process building and machine shop; adjacent to sewer lines and the wastewater treatment pit; within the cucumber tank yard; and within the filled low-lying area. The passive soil gas sampling methodology and laboratory analytical results are presented below. A summary of the passive soil gas sampling analytical results is included in Table 3-5 and depicted on Figure 3-2.

3.3.3.1 PASSIVE SOIL GAS SAMPLER INSTALLATION METHODOLOGY

Twenty-three primary passive soil gas samplers were installed at the Site on January 25, 2006. The samplers were constructed of an approximately three-inch long, one-half-inch diameter glass vial equipped with a perforated screw cap. Two hydrophobic sorbent filaments were contained

in each glass vial to adsorb VOCs present in the vapor phase. A retrieval wire attached to the glass vial was used to lower and retrieve the sampler.

An electric rotating hammer drill outfitted with a one-inch diameter drill bit was used to drill borings to approximately one-foot below ground surface. A laboratory supplied 12-inch long, 3/4-inch diameter copper protective sleeve was then inserted into the borehole. The passive soil gas samplers were installed within the annulus of the copper protective sleeve using the retrieval wire. An aluminum foil plug was placed in the annulus of the protective copper sleeve above the sampler. The top of the protective copper sleeve was plugged at the ground surface with a bentonite seal and a three-millimeter layer of concrete.

3.3.3.2 PASSIVE SOIL GAS SAMPLER RETRIEVAL METHODOLOGY

The passive soil gas samplers were retrieved from the boreholes on February 15, 2006, three weeks after installation. The passive soil gas samplers were retrieved by removing the bentonite/concrete seal and lifting the passive soil gas sampler from the copper protective sleeve using the retrieval wire. The perforated screw cap was then replaced with a solid screw cap, labeled and placed in a chilled cooler for transportation to the analytical laboratory. The passive soil gas samplers were submitted to Beacon Environmental Laboratories of Bel Air, Maryland, following chain-of-custody procedures outlined in ASTM D 4840 and analyzed for VOCs including 1,4-dioxane.

3.3.3.3 PASSIVE SOIL GAS SAMPLE ANALYTICAL RESULTS

Laboratory analysis of the passive soil gas samplers revealed PCE ranging between 63 nanograms per sampler (ng/sampler; P-12) and 924 ng/sampler (P-10) in the samples collected within the vicinity of the loading dock. PCE was also reported: between 75 ng/sampler and 122 ng/sampler in the samples collected near the sanitary sewer (P-15, P-19 and P-20); between 60 ng/sampler (P-5) and 661 ng/sampler (P-1) in the samples collected from the filled low-lying area; and between 29 ng/sampler (P-21) and 148 ng/sampler (P-22) in the samples collected near the machine shop.

Laboratory analysis revealed TCE above the laboratory reporting limit of 25 ng/sampler in three of the 23 samplers, i.e., 81 ng/sampler in the sample collected in the filled low-lying area (P-1); 175 ng/sampler in the sample collected near the machine shop (P-21); and 36 ng/sampler in the sample collected east of the pickle processing building (P-23).

Laboratory analysis revealed TCA above the laboratory reporting limit of 25 ng/sampler in three of the 23 samplers, i.e., 1,862 ng/sampler in the sample collected near a drop inlet located in the loading dock (P-10); and at 71 ng/sampler and 1,698 ng/sampler in the samples collected between the pickle processing building and the machine shop (P-22 and P-23).

Laboratory analysis of passive soil gas samplers revealed the petroleum hydrocarbon related VOCs, benzene, toluene and xylenes: in the sample collected from near the loading dock (P-11); and to the east of the pickle processing building (P-23). Laboratory analysis of the passive soil gas samplers also revealed toluene up to 216 ng/sampler near the concrete trenches used for transporting brine wastewater (P2, P-3 and P-5); ethylbenzene at 173 ng/sampler in the sample collected in a concrete trench within the cucumber tank yard (P-2); and xylenes up to 101 ng/sampler in the samples collected in the vicinity of the machine shop (P-21 and P-23).

3.3.3.4 QUALITY CONTROL SAMPLES

One duplicate passive soil gas sample, P-10D and one travel blank were analyzed for quality control. The relative standard deviation of the duplicate samples ranged from 0 to 2.4 percent. Laboratory analysis did not reveal VOCs in the travel blank passive soil gas sampler above the laboratory-reporting limit of 25 ng/sampler. Copies of the laboratory data certificates and chain of custody forms are included in Appendix A.

3.3.4 Soil Sampling

On January 25, 2006, six soil samples (P-10, P-13, P-14, P-17, P-19 and P-23) were collected from six of the borings advanced adjacent to the pre-1975 structures. The six soil samples were collected from the first soil encountered at approximately one-foot below ground surface, i.e.,

approximately 6-inches below the 6- to 8-inch thick concrete paved surface, to characterize the potential contribution of lead to soil from lead-based paint.

Following a review of the passive soil gas sampling analytical results, the locations, depth and number of soil samples were finalized with concurrence from DTSC on February 28, 2006. On March 2, 2006, 26 soil samples (W-18 to W-26 to W-28 and W-31) were collected to address the data gaps identified in the *Work Plan*. The soil samples were collected at approximately one, three, five or eight feet below ground surface to:

- Delineate the lateral and vertical extent of TPHd and TPHmo in the vicinity of the wash rack (W-18 to W-20) and the drop inlet near the loading dock (W-21 to W-23);
- Characterize the presence of VOCs near the loading dock (W-21 to W-24; W-28); machine shop (W-25); and the cucumber tank yard (W-31); and
- Characterize the lateral and vertical extent of VOCs, pesticides and metals in the filled low-lying area (W-26 and W-27).

The soil sampling methodology and laboratory analytical results are presented below. A summary of the soil sampling analytical results are included in Tables 3-1, 3-2 and 3-6 and depicted on Figure 3-1.

3.3.4.1 SOIL BORINGS

On January 25, 2006, soil samples (P-10, P-13, P-14, P-17, P-19 and P-23) were collected from six borings. The borings were advanced to approximately one-foot below ground surface using an electric rotating hammer drill outfitted with a one-inch diameter drill bit. The soil samples were collected from approximately 6-inches below the 6- to 8-inch thick concrete paved surface

On March 2, 2006, twelve borings (W-18 to W-28 and W-31) were advanced at the Site using hydraulic direct push equipment operated by En Prob Drilling of Oroville, California, a

California C-57 licensed well drilling contractor. The twelve borings were advanced using 2-inch diameter push rods equipped with a 4-foot long 2-inch diameter core barrel outfitted with a disposable acetate liner insert.

Ten of the 12 direct push borings were advanced to a depth of approximately three feet below ground surface in the vicinity of the: former wash rack drop inlet (W-18 to W-20); drop inlet near the loading dock (W-21 to W-23); pickle processing building and warehouse (W-24 and W-28); former machine shop (W-25); and the concrete trench within the cucumber tank yard (W-31). In addition, two of the direct push borings were advanced to a depth of approximately eight feet below ground surface in the vicinity of the filled low-lying area (W-26 and W-27).

The soil cores from the direct push borings were collected continuously within the acetate liner and field screened for organic vapors using a Thermo Instruments, Inc., Model 580B, photo-ionization detector (PID) calibrated with isobutylene gas. The PID readings for borings W-26 and W-27 and a description of the subsurface lithology were recorded on boring logs using the Unified Soil Classification System (USCS). Lithologic logs for the soil cores collected at W-26 and W-27 are included in Appendix B.

3.3.4.2 SOIL SAMPLE COLLECTION METHODOLOGY

Soil cuttings from the passive soil gas sample borings were placed in laboratory supplied four-ounce glass jars, capped with a Teflon[®]-lined lid, labeled and place in a chilled cooler for transportation to the analytical laboratory.

Soil samples from the direct push borings were collected by cutting approximately six-inch long sections of the acetate liner from the target depth interval, capped with Teflon[®] sheets and plastic end caps, labeled and place in a chilled cooler for transportation to the analytical laboratory. When analyzing for VOCs, three 5-milligram aliquots were also collected from the ends of the acetate liner in accordance with United States Environmental Protection Agency (USEPA) Method 5035, using EnCore[™] sample containers. The 5-milligram EnCore[™] sample containers

were then capped, placed in a self-sealing foil pouch, labeled and placed in a chilled cooler for transportation to the analytical laboratory.

The soil samples were submitted to Department of Health Services (DHS) Environmental Laboratory Accredited Program (ELAP) certified laboratories pursuant to ASTM D4840 chain-of-custody protocols. The primary samples were submitted to K Prime Laboratories of Santa Rosa, California and duplicate samples were submitted to Analytical Science of Petaluma, California. The soil samples collected from the passive soil gas borings were analyzed for lead by USEPA Method 6020. Select soil samples collected from the direct push borings were analyzed for one or more of the following: TPHd and TPHmo by USEPA Method 8015M; benzene, toluene, ethyl benzene, xylenes and MTBE by USEPA Method 8021; VOCs and 1,4-dioxane by USEPA method 8260B; organochlorine pesticides by USEPA Method 8081A; and metals by USEPA Method 7000/6000.

3.3.4.3 SOIL SAMPLE ANALYTICAL RESULTS – TPHD AND TPHMO

Three borings (W-18 to W-20) were advanced near the wash rack pad to characterize the lateral and vertical extent of TPHd, previously reported at 849 mg/kg in the soil sample collected from boring W-13. Soil samples were collected from the borings at approximately one-foot and three-feet below ground surface, i.e., approximately zero and two-feet below the bottom of the drop inlet within the wash rack pad. The borings W-18 to W-20 were located approximately 20 feet north, west and south of soil sample W-13.

Laboratory analysis of the soil samples, W-18 and W-19, located approximately 20 feet north and west of W-13, respectively, did not reveal TPHd or TPHmo above their laboratory reporting limit of 10.0 mg/kg and 10.0 mg/kg in the samples collected from one-foot or three-feet below ground surface. Laboratory analysis of the soil sample, W-20, located approximately 20 feet south of W-13, did not reveal TPHd above the laboratory-reporting limit of 400 mg/kg at one-foot below ground surface. TPHmo in soil sample, W-20, was reported at 1,370 mg/kg at one-foot below ground surface. Laboratory analysis did not reveal TPHd and TPHmo above the laboratory reporting limit of 10 mg/kg at three-feet below ground surface. TPH appears to be

vertically limited to approximately three-feet below ground surface and has been laterally defined by soil sample locations W-18 and W-19, located approximately 20 feet north and west of soil sample W-13.

Three borings (W-21 to W-23) were advanced in the vicinity of the loading dock drop inlet to characterize the lateral and vertical extent of TPHd, previously reported at 184 mg/kg in the soil sample collected from boring W-10. Soil samples were collected from the borings at approximately one-foot and three-feet below ground surface at a distance of approximately 40 feet northeast, west and southeast of soil sample W-10.

Laboratory analysis of the soil samples collected at W-21 to W-23 did not reveal TPHd above the laboratory-reporting limit of 10.0 mg/kg at one-foot or three-feet below ground surface; or TPHmo above the laboratory-reporting limit of 10.0 mg/kg at three-feet below ground surface. Laboratory analysis did reveal TPHmo at 11.2 mg/kg and 20.6 mg/kg in the soil samples collected from W-21 and W-22, respectively at one-foot below ground surface. TPHmo was not detected in soil above the laboratory-reporting limit of 10.0 mg/kg at W-23. The TPH in soil reported above the PRG of 100 mg/kg is: vertically limited to three-feet below ground surface; and laterally limited by soil sample locations W-21 to the south, W-22 to the east and W-23 to the west.

3.3.4.4 SOIL SAMPLE ANALYTICAL RESULTS – VOCs

Seven borings were advanced in the vicinity of: the loading dock (W-21 to W-24 and W-28); the machine shop (W-25); and the filled low-lying area, to characterize the lateral and vertical extent of VOCs, including PCE and TCE reported in passive soil gas sampler analytical results. Soil samples were collected from the borings at approximately one-foot and three-feet below ground surface. One boring, W-31, was also advanced in the cucumber tank yard to characterize the presence of toluene and ethyl benzene reported in passive soil gas sampler P-2.

Laboratory analysis of soil samples collected at one-foot and three-feet below ground surface for the analysis of VOCs did not reveal the presence of ethyl benzene, xylenes or MTBE above the

laboratory-reporting limits ranging from 1.20 µg/kg to 3.11 µg/kg (Table 3-1). Laboratory analysis did not reveal the presence of 1,4-dioxane above its reporting limit, which ranged from 120 µg/kg to 311 µg/kg. A summary of the soil sample analytical results is presented below.

3.3.4.5 PCE IN SOIL

Laboratory analysis of the soil samples collected near the loading dock revealed that the detections of PCE were limited to borings W-23 and W-24. PCE was detected in soil samples collected at one-foot below ground surface at 1.81 µg/kg (W-23) and at 9.07 µg/kg (W-24). PCE was also detected at similar or lower concentrations in the samples collected at three-feet below ground surface at 2.75 µg/kg (W-23) and 2.80 µg/kg (W-24). PCE was not detected above the laboratory-reporting limits in the samples collected from borings W-21, W-22 and W-28. The distribution of PCE in the loading dock has been vertically and laterally defined by soil sample locations W-21 and W-22, located approximately 60 feet to the southeast and northeast of soil sample W-23, respectively.

Laboratory analysis of the soil sample, W-25, collected between the pickle processing building and the machine shop did not reveal PCE above the laboratory reporting limit of 1.49 µg/kg at one-foot below ground surface; but did reveal PCE at 2.66 µg/kg at three-feet below ground surface.

Laboratory analysis of the soil sample, W-26, collected within the filled low-lying area, revealed PCE at 5.58 µg/kg at one-foot below ground surface and at 10.1 µg/kg in the sample collected at three-feet below ground surface. The detection of PCE in the soil samples collected near the filled low-lying area is consistent with the PCE detected in the passive soil gas samplers in the same area.

3.3.4.6 TCA IN SOIL

Laboratory analysis did not reveal TCA in the soil samples, W-21 to W-25, W-23 and W-31, above the laboratory-reporting limits ranging from 1.26 µg/kg of 3.11 µg/kg (at one-foot and

three-feet below ground surface), except at the soil sample location, W-23, collected near the loading dock. Laboratory analysis of the soil sample, W-23, revealed TCA at: 1.80 µg/kg at one-foot below ground surface; and 1.59 µg/kg at three-feet below ground surface. The presence of TCA in the soil sample from boring W-23 is vertically limited to approximately three-feet below ground surface and laterally defined by soil samples W-24, W-21 and W-22, located to the southwest, southeast and northeast of soil sample W-23, respectively.

3.3.4.7 BENZENE, TOLUENE AND 4-ISOPROPYLTOLUENE IN SOIL

Laboratory analysis did not reveal benzene or toluene above the laboratory-reporting limits ranging between 1.20 µg/kg to 3.11 µg/kg (at one-foot and three-feet below ground surface), except at the soil samples collected at three-feet below ground surface at location W-28, located near the loading dock. Laboratory analysis of the soil sample, W-28, collected at three-feet below ground surface, revealed benzene at 1.40 µg/kg and toluene at 1.48 µg/kg. Laboratory analysis also revealed 4-isopropyltoluene at 4.31 µg/kg in the soil sample collected at one-foot below ground surface at location W-28, located in the filled low-lying area. The concentration of 4-isopropyltoluene at soil sample location, W-28 is vertically limited to three-feet below ground surface.

3.3.4.8 PESTICIDES IN SOIL

Two borings were advanced to eight-feet below ground surface near the filled low-lying area (W-26 and W-27). Soil samples were collected from the borings at approximately three-feet and five-feet below ground surface to confirm the presence of organochlorine pesticides and total metals detected during the Phase II ESA investigation (WEST, 2006a).

Laboratory analysis of the soil samples collected at three-feet and five-feet below ground surface in the vicinity of the filled low-lying area (W-26 and W-27) did not reveal the organochlorine pesticide chlordane above its laboratory reporting limit of 50 µg/kg, which is below its PRG of 430 µg/kg. Laboratory analysis of the soil samples collected from boring W-26 and W-27 revealed DDT at 219.4 µg/kg in the soil sample, W-26, collected at three-feet below ground

surface, which is below its PRG of 1,600 µg/kg. Laboratory analysis did not reveal DDT in the soil sample, W-27, collected at three-feet and five-feet below ground surface or the soil sample W-26 collected at five-feet below ground surface. The lateral and vertical extent of DDT in the filled low-lying area is limited to the area adjacent to boring W-27.

3.3.4.9 METALS IN SOIL

Laboratory analysis of the soil samples collected at approximately one-foot below ground surface, adjacent to the pre-1975 structures revealed lead ranging from: 4.78 mg/kg in the soil sample collected south of the sanitary sewer on the northwest corner of the Site (P-19); to 49.0 mg/kg in the soil sample collected west of the office/laboratory (P-14). Laboratory analysis of the soil samples collected at three-feet and five-feet below ground surface within the filled low-lying area revealed lead ranging between 6.30 mg/kg (W-27 at five-feet below ground surface) and 10.8 mg/kg (W-26 at three-feet below ground surface).

Laboratory analysis of the soil samples collected at three-feet below ground surface within the filled low-lying area revealed arsenic at 8.72 mg/kg (W-27) and 10.7 mg/kg (W-26). The concentration of arsenic in the soil samples collected at five-feet below ground surface was reported at 6.69 mg/kg (W-27) and 6.31 mg/kg (W-26). A summary of the soil sample analytical results for metals is included in Table 3-2 and depicted on Figure 3-1.

3.3.4.10 SOIL PHYSICAL PARAMETERS

Pursuant to the CalEPA soil gas sampling guidance (CalEPA, 2003), three soil samples (W-24, W-25 and W-28) were collected at three-feet below ground surface and analyzed by Environmental Technical Services of Petaluma, California for dry bulk density at 90 percent compaction; and K Prime Laboratory of Santa Rosa, California for fraction of organic carbon content using the Walkee Black Method.

Laboratory analysis of the soil samples revealed dry bulk density ranging between 100.8 pounds per cubic foot to 112.5 pounds per cubic foot; organic carbon ranging between 0.00002 grams

per gram (g/g) and 0.00022 g/g; and soil moisture ranging between 15.34 percent and 19.1 percent. A summary of the soil sample analytical results for physical parameters is included in Table 3-6.

3.3.5 Active Soil Gas Sampling

Based on the passive soil gas sample analytical results, eight active soil gas samples (W-21 to W-25, W-28, W-30 and W-31) were collected from five-feet below ground surface to characterize the extent of VOCs in soil gas. Quality assurance/quality control (QA/QC) procedures were implemented during active soil gas sample collection to provide data of known quality. Summaries of the soil sampling methodology and laboratory analytical results are presented below. A summary of the soil gas sample analytical results are also included in Table 3-3 and depicted on Figure 3-2.

3.3.5.1 ACTIVE SOIL GAS SAMPLE COLLECTION METHODOLOGY

The eight active soil gas samples were collected in the vicinity of the loading dock, pickle processing building, machine shop and cucumber tank yard following the procedures outlined in ASTM D 5314 and the California Environmental Protection Agency's Advisory – *Active Soil Gas Investigation* (CalEPA, 2003). A two-inch diameter steel push rod outfitted with a disposable perforated tip was driven into the subsurface to approximately three inches past the target sample depth using hydraulic direct-push equipment. A length of disposable 1/4-inch diameter polyethylene tubing was attached to the retractable tip within the push rods and connected to a peristaltic pump at the ground surface. The steel rod was then retracted approximately three inches to expose the perforated tip, allowing soil gas to enter the tubing. A bentonite seal was then placed around the contact between the ground surface and the steel rod.

Prior to soil gas sample collection, a purge volume test was performed for each unique geologic stratum, which consisted of removing approximately one, three and seven tubing volumes of soil gas using the peristaltic pump, while field screening the purge effluent. The purge effluent was field screened for organic vapors using a photo-ionization detector (PID) calibrated with

isobutylene gas. The appropriate tubing purge volume to be removed prior to soil gas sample collection was selected based on the maximum organic vapor concentration measured with the PID at each purge volume interval. Based on the purge testing, approximately three purge volumes were removed prior to sample collection. The results of the purge volume testing were recorded on field data forms (Appendix C).

Following purging activities, the tubing was attached to a laboratory prepared one-liter Summa canister. The Summa canisters were delivered by the laboratory with a vacuum of approximately 30-inches of water and outfitted with 0.2-liter per minute flow control valve. The tubing was connected to the Summa canister using airtight stainless-steel fittings. The flow control valve was then opened slowly to draw the vapor sample from the target depth. Following sample collection, the Summa canister atmosphere was measured with a pressure gauge and recorded on field data forms. Leak detection monitoring was conducted during soil gas sampling by applying a compressed tetrafluoroethane gas to the bentonite seal and connection fittings. Vapor permeability of soil was measured following collection of the soil gas samples.

All down hole equipment was decontaminated with detergent and triple rinsed with deionized water prior to reuse. The active soil gas samples were then labeled and transported to K Prime, Inc. of Santa Rosa, California, a DHS ELAP certified laboratory, following the chain-of-custody procedures outlined in ASTM D 4840. The soil gas samples were analyzed for VOCs using USEPA Method TO-14A/TO-15.

3.3.5.2 ACTIVE SOIL GAS SAMPLE ANALYTICAL RESULTS

Laboratory analysis of the active soil gas samples collected at five-feet below ground surface did not reveal the presence of DCE, chloroethane, 1,1-DCE, 1,1-DCA, chloromethane, dichlorodifluoromethane, or ethylbenzene above their respective laboratory reporting limits ranging between $2.07 \mu\text{g}/\text{m}^3$ and $24.7 \mu\text{g}/\text{m}^3$ (Table 3-3).

Laboratory analysis of active soil gas samples revealed: TCE up to $34.4 \mu\text{g}/\text{m}^3$ (W-24); TCA up to $31.6 \mu\text{g}/\text{m}^3$ (W-23); TCM up to $36.6 \mu\text{g}/\text{m}^3$ (W-31); 1,2,4-trimethylbenzene up to $7.28 \mu\text{g}/\text{m}^3$

(W-24); benzene up to $43.1 \mu\text{g}/\text{m}^3$ (W-28); toluene up to $9.19 \mu\text{g}/\text{m}^3$ (W-25); and xylenes up to $11.1 \mu\text{g}/\text{m}^3$ (W-24). The reported concentrations of TCE, TCA, TCM, 1,2,4-trimethylbenzene benzene, toluene and xylenes in active soil gas samplers were below their respective PRGs (Table 3-3).

3.3.5.3 PCE IN SOIL GAS

Laboratory analysis of six of the eight active soil gas samples did not reveal the presence of PCE above the laboratory-reporting limits ranging between $6.78 \mu\text{g}/\text{m}^3$ and $33.9 \mu\text{g}/\text{m}^3$. The highest detection of PCE in soil gas at $1,090 \mu\text{g}/\text{m}^3$ was found in the sample collected within the loading dock (W-24) above its PRG of $180 \mu\text{g}/\text{m}^3$.

The presence of the highest detection of PCE in soil gas at W-24 appears to be consistent with the highest detection of PCE in passive soil gas sampler P-10 (924 ng/sampler). The lateral distribution of PCE at active soil gas location W-24 was defined by W-23, located approximately 30 feet to the northeast and W-28, located approximately 45 feet east of W-24.

The distribution of PCE in the active soil gas samplers appears consistent with the distribution found in the passive soil gas samplers. PCE in active soil gas samples decreased from $1,090 \mu\text{g}/\text{m}^3$ at sample location W-24, to the west toward sample location W-30, where PCE was not detected above the laboratory-reporting limit of $17.0 \mu\text{g}/\text{m}^3$. Similarly, the reported detections of PCE in passive soil gas samplers decreased from the high of 924 ng/sampler at sample location P-10, to the west toward P-12, which had PCE reported at 80 ng/sampler.

A similar correlation of active and passive soil gas samples is present to the east of sample location W-24. The PCE in passive soil gas samplers located at P-9 and P-11 were reported at less than 25 ng/sampler and 80 ng/sampler, respectively; these samples were collected from near active soil sample location W-28, where the PCE was not detected above its laboratory-reporting limit of $33.9 \mu\text{g}/\text{m}^3$.

PCE was also reported at $33.6 \mu\text{g}/\text{m}^3$ in the active soil gas sample collected between the pickle processing building and machine shop (W-25). Passive soil gas samplers in this area, e.g., P-19 at 75 ng/sampler, P-20 at 122 ng/sampler and P-22 at 148 ng/sampler, were consistent with the active soil gas findings near the machine shop.

3.3.5.4 1,4-DIOXANE IN SOIL GAS

Laboratory analysis of the active soil gas samples revealed 1,4-dioxane above the laboratory-reporting limit of between $7.1 \mu\text{g}/\text{m}^3$ and $36.0 \mu\text{g}/\text{m}^3$ in three of the eight samples collected. 1,4-dioxane was reported at: $218 \mu\text{g}/\text{m}^3$ (W-24) and $56.2 \mu\text{g}/\text{m}^3$ (W-30) in the active soil samples collected within the loading dock; and $1,610 \mu\text{g}/\text{m}^3$ in the active soil gas sample collected adjacent to a concrete trench in the cucumber tank yard (W-31).

The active soil gas concentration of $4,370 \mu\text{g}/\text{m}^3$ (W-11) collected in 2005 was approximately 77 times higher than the active soil gas sample collected at the same location in 2006 ($56.2 \mu\text{g}/\text{m}^3$ at W-30). The difference in 1,4-dioxane active soil gas concentrations between the two sampling events has been attributed to differences in the depth to water and soil moisture content.

3.3.5.5 QUALITY CONTROL SAMPLES

One duplicate active soil gas sample, W-24D was analyzed for quality control. The relative standard deviation of the duplicate sample ranged up to 7.7 percent. Laboratory analysis of the active soil gas samples for tetrafluoroethane, the compressed gas used for leak detection monitoring, did not reveal concentrations above the laboratory-reporting limit of $8,300 \mu\text{g}/\text{m}^3$, except in the active soil gas sample collected at W-28 ($14,000 \mu\text{g}/\text{m}^3$). The detection of tetrafluoroethane in the soil gas sample collected from W-28 indicates that the reported concentrations are likely biased lower than actually present. A summary of the active soil gas sampling analytical results is included in Table 3-3 and depicted on Figure 3-2. Copies of the laboratory data certificates and chain-of-custody are included in Appendix A.

3.3.6 Groundwater Sampling

Four permanent monitoring wells, MW-1, MW-2, MW-3 and MW-4, were installed at the Site on March 1 and 2, 2006. The monitoring wells were installed to approximately 26 feet below ground surface to: characterize the lateral distribution of VOCs in groundwater; and develop data to establish the groundwater flow direction and gradient.

Based on the results of the passive soil gas sampling and input from DTSC, three grab groundwater samples were collected to define the lateral distribution of VOCs. The grab groundwater samples were collected from three temporary monitoring wells advanced at the Site, i.e., W-28, W-29 and W-30. A summary of the well installation methodology, groundwater sampling methodology and laboratory analytical results is presented below. A summary of the groundwater sample analytical results is also included in Table 3-4 and depicted on Figure 3-3.

3.3.6.1 GROUNDWATER BORINGS

Seven borings, MW-1 to MW-4 and W-28 to W-30, were advanced at the Site using hydraulic direct push equipment. Borings MW-1 to MW-4 were advanced to approximately 26 feet below ground surface, approximately 10 feet below the top of the first encountered groundwater-bearing zone. Borings W-28 to W-30 were advanced to approximately 20 feet below ground surface, approximately four feet below the top of the first encountered groundwater-bearing zone. The direct push equipment was operated by En Prob Drilling of Oroville, California, a California C-57 licensed well drilling contractor. The seven borings were advanced using 2-inch diameter push rods equipped with a 4-foot long 2-inch diameter core barrel outfitted with a disposable acetate liner insert.

A description of the subsurface lithology encountered during advancement of the borings was recorded on logs using the Unified Soil Classification System (USCS). The soil cores were field screened for organic vapors using a Thermo Instruments, Inc., Organic Vapor Model (OVM), Model 580B, PID calibrated with isobutylene gas. The PID readings were recorded on the boring logs (Appendix B).

3.3.6.2 WELL CONSTRUCTION

Following advancement of the borings, 3/4-inch diameter Schedule 40 PVC pre-packed slotted well screens with 0.010-inch slots and a filter pack of # 2/12 sand were placed within the boring annuli. The slot-screen and filter-pack sizes were selected based on the Site geology. The tops of the pre-pack well screens were outfitted with 3/4-inch diameter Schedule 40 PVC blank casing to the ground surface. Fifteen feet of pre-packed screen was placed within the permanent monitoring wells, MW-1 to MW-4, to allow for seasonal fluctuation in the groundwater table. Five feet of pre-packed screen was placed within the temporary monitoring wells, W-28 to W-30.

In the permanent monitoring wells, a minimum of one-foot of sand and two-feet of bentonite was placed above the top of the pre-packed screen. A sanitary seal consisting of Portland cement grout was then placed from the bentonite seal to the ground surface. The tops of the well casings were outfitted with steel traffic-rated well-boxes and locking well-caps. Grouting of the permanent monitoring wells was inspected by the Alameda County Public Works Agency pursuant to the permit conditions. A summary of the groundwater monitoring well construction details is presented in Table 3-7.

Following collection of groundwater samples from the temporary monitoring wells, the pre-packed well screens were removed and the boring annuli sealed to the surface with Portland cement grout.

3.3.6.3 WELL DEVELOPMENT

The permanent monitoring wells, MW-1 to MW-4, were developed approximately 24-hours after installation to remove suspended materials generated during the drilling. The well development activities were conducted pursuant to CalEPA's *Monitoring Well Design and Construction for Hydrogeologic Characterization Guidance – Manual for Ground Water Investigations* (CalEPA, 1995). Well development activities consisted of inserting a surge block equipped with a wiper within the PVC casing and surging the water within the well casing to flush suspended material

through the sand filter pack. Following surging activities, the water within the well casing was purged using a peristaltic pump and disposable polyethylene tubing.

Groundwater quality parameters including temperature, pH, dissolved oxygen (DO), conductivity and turbidity were monitored during the well purging activities. The groundwater was purged from the well casing until water quality parameters had stabilized to within approximately ten percent of the previous measurements and turbidity was less than 10 Nephelometric Turbidity Units (NTUs). Measurements taken during well development were recorded on field data sheets (Appendix C). Well development purge water was placed within a United States Department of Transportation-approved 20-gallon steel drum, labeled and stored onsite pending disposal.

3.3.6.4 WELL SURVEY

Following groundwater monitoring well installation, the elevations of the top of the well casings were surveyed by Luk & Associates of Hercules, California, a California State licensed land surveyor, to the nearest 0.01-foot above Mean Sea Level (MSL) North American Vertical Datum of 1988 (NAVD 1988). The well elevation survey was used to calculate the groundwater elevation at each monitoring well location for determination of groundwater flow direction and gradient.

3.3.6.5 DEPTH TO WATER MEASUREMENTS

Prior to groundwater sampling on March 3, 2006, the depth to groundwater was measured in the monitoring wells using an electronic sounding device from the ground surface to the nearest hundredth foot. The depth to groundwater measured in the monitoring wells ranged between 15.33 feet (MW-1) to 16.81 feet (MW-4) below ground surface. Groundwater elevations were calculated between 26.17 feet above MSL (MW-2) and 28.17 feet above MSL (MW-4). Based on the groundwater elevations, the groundwater flow direction was calculated to the east at a hydraulic gradient of 0.004 feet per foot. The depth to groundwater measurements and

groundwater elevations are summarized in Table 2-1. The groundwater elevations, flow direction and gradient are depicted on Figure 2-1.

3.3.6.6 GROUNDWATER SAMPLE COLLECTION METHODOLOGY

The permanent (MW-1 to MW-4) and temporary (W-28 to W-30) monitoring wells were sampled between March 2 and March 7, 2006 using low flow sampling techniques (USEPA, 1996). Prior to sample collection, the permanent monitoring wells were purged. During purging, groundwater parameters including pH, dissolved oxygen, temperature, electrical conductivity and turbidity were measured to monitor stability of parameters indicating the presence of formation water. Depth to water was monitored during purging activities and flow rates adjusted accordingly to minimize drawdown to within 0.33 feet (USEPA, 1998).

Groundwater samples were collected once the indicator parameters collected during purging had stabilized for three consecutive readings, as follows: plus/minus 0.1 Standard Units (S.U.) for pH; plus/minus three percent for specific conductance; and plus/minus 10 percent for turbidity and dissolved oxygen (USEPA, 1996).

Following purging, the groundwater samples were collected into laboratory supplied zero headspace 40-milliliter glass volatile organic analysis (VOA) vials preserved with hydrochloric acid for laboratory analysis of VOCs (for the groundwater samples collected from MW-1 to MW-4 and W-28 to W-30). Groundwater samples from the monitoring wells were placed in one liter amber jars for the laboratory analysis of 1,4-dioxane; insufficient water was available for analysis of 1,4-dioxane in the samples collected from the temporary monitoring wells. Following sample collection, the samples were labeled, placed in a chilled cooler and transported to the analytical laboratory.

The groundwater samples were submitted to DHS, ELAP certified laboratories pursuant to ASTM D4840 chain-of-custody protocols. The primary samples, travel blank and equipment blank were submitted to K Prime Laboratories of Santa Rosa, California and duplicate samples were submitted to Analytical Science of Petaluma, California. The groundwater samples were

analyzed for VOCs using USEPA Method 8260; and samples from the monitoring wells were analyzed for 1,4-dioxane using USEPA 8270C-SIM.

3.3.6.7 GROUNDWATER ANALYTICAL RESULTS

Laboratory analysis of the groundwater samples did not reveal 1,4-dioxane above the laboratory-reporting limit of 3.00 µg/l; or BTEX and MTBE above the laboratory-reporting limit of 0.500 µg/l. DCE was only reported to be present in one groundwater sample above the laboratory-reporting limit of 0.500 µg/l, i.e., in the sample collected from MW-3 at 7.17 µg/l.

Laboratory analysis of the groundwater samples revealed the highest PCE at 19.1 µg/l from the sample collected from downgradient permanent monitoring well MW-1, located in the northwest portion of the Site. Laboratory analyses of the groundwater samples also revealed PCE at: 6.64 µg/l in the sample collected from hydraulically upgradient monitoring well MW-4, located on the northeastern portion of the Site. PCE was detected at 16.8 µg/l and 16.4 µg/l in the samples collected from the temporary monitoring wells W-28 and W-30 within the loading dock area. PCE was reported at lower concentrations, i.e., 7.06 µg/l in the sample from the downgradient monitoring well MW-2, located approximately 120 feet south of the loading dock. Laboratory analysis of groundwater samples did not reveal PCE above the laboratory-reporting limit of 0.500 µg/l in the samples collected from the temporary monitoring well W-29 and permanent monitoring well MW-3, which are located along the southern and southeastern perimeter of the Site.

Laboratory analyses revealed TCE at 0.650 µg/l (W-28) and 0.640 µg/l (W-30) in the groundwater samples collected from the temporary monitoring wells in the loading dock area. TCE was also reported at 1.95 µg/l (MW-2) and 0.820 µg/l (MW-3) in the groundwater samples collected from the southern portion of the Site. Laboratory analysis did not reveal TCE above the laboratory-reporting limit of 0.500 µg/l in the groundwater samples collected from W-29, MW-1 or MW-4. A summary of the analytical results for the groundwater samples is included in Table 3-4 and depicted on Figure 3-3.

3.3.6.8 QUALITY CONTROL SAMPLES

Two duplicate groundwater samples and one travel blank were analyzed for quality control. The relative standard deviation of the duplicate groundwater samples collected at MW-1 for PCE analysis was calculated at 22 percent. Laboratory analysis of the groundwater samples collected at MW-4 for 1,4-dioxane analysis did not reveal detections above the laboratory-reporting limits of 0.500 µg/l and 1.0 µg/l, respectively. Laboratory analysis of the travel blank (trip blank) did not reveal VOCs above the method detection limit of 0.500 µg/l, except for trichloromethane (TCM) at 11.6 µg/l. The source of TCM has been attributed to the non-laboratory grade de-ionized water used in the travel blank.

4.0 DATA EVALUATION

Investigations have revealed the presence of: TPH, organochlorine pesticides and metals in soil; and VOCs in soil gas and groundwater at the Site. An assessment of the potential risks to human health and the environment associated with the presence of these chemicals required an accurate Conceptual Site Model (CSM) and comparison with appropriate evaluation criteria.

A CSM was developed that incorporated all of the Site data and described the fate and distribution of chemicals at the Site. The CSM also aided in identifying potential receptors to allow for selection of applicable evaluation criteria. Through a comparison of Site data to applicable criteria, the CSM was used to assess the adequacy of the Site characterization and identify whether more information is required to make decisions regarding the necessity for response actions, i.e., data gaps (Figure 4-1).

4.1 CONCEPTUAL SITE MODEL

Pursuant to the DTSC guidance documents, a CSM has been prepared for the Site (DTSC, 1999). The decision-making framework for Site investigations was developed based on the CSM. The CSM developed for the Site, which represents the assemblage of the existing Site data and the general physical conditions that influence contaminant transport is depicted on Figure 4-1.

The CSM presents the primary and secondary sources of TPH and VOCs and their release mechanisms to soil, soil gas and groundwater. The CSM was developed based on: known historical operations at and adjacent to the Site; investigation results; properties of the chemicals present; suspected chemical release mechanisms; transport mechanisms; and potential exposure scenarios.

The decision-making framework for Site investigations centers on the development and continual modification of the CSM and identifies the general physical conditions that influence contaminant transport. The CSM developed for the Site represents the assemblage of all the data and information regarding Site conditions. The CSM incorporates the geology and

hydrogeology, properties of the chemicals, chemical usage and identifies sources, transport mechanisms and potential exposure scenarios to explain the distribution of chemicals found at and near the Site.

A thorough review of historic operations, waste management practices, chemical distribution in soil and groundwater, groundwater flow, preferential pathways and transformation byproducts was performed in the development of the CSM. A review of the findings indicates that the CSM supports the conclusion that onsite contributions to soil and soil gas are limited to incidental spills and leaks and that offsite releases are responsible for the VOCs in Site groundwater.

4.1.1 Historical Chemical Use and Releases

A thorough review of historical chemical uses and releases was conducted of using available documents including: historical topographic maps; historical aerial photographs; published scientific literature; standard environmental databases; and interviews with the former property owner. The review of the historical operations at the Site revealed that cleaning agents and solvents containing VOCs, e.g., TCA were used and stored on the Site in the vicinity of the process buildings and machine shop. The presence of 1,4-dioxane is associated with its use as a stabilizer for TCA (Mohr, 2001). However, as 1,4-dioxane is persistent, i.e., not degraded by indigenous soil microorganisms, it is found in the absence of the more degradable solvent TCA (Mohr, 2001). Wastewater containing the cleaning agents was conveyed through concrete trenches and subsurface piping to the onsite wastewater treatment pit prior to discharge to the sanitary sewer.

A review of the historical operations on adjoining properties revealed a documented upgradient and offsite release of PCE to groundwater at 60 µg/l (Geotracker, 2006). Groundwater samples collected from onsite monitoring wells revealed PCE at lower concentrations, i.e., 6.64 µg/l (MW-4) to 19.1 µg/l (MW-2). As there is no documented use of PCE onsite and based on the Site data, the presence of PCE in groundwater appears wholly attributable to the upgradient release. However, the distribution of PCE onsite appears to have been influenced by historical pumping of the onsite water supply well, which extracted groundwater containing PCE. The

extracted groundwater was used as process water resulting in subsequent percolation to the subsurface through concrete trenches and leaking pipes. Leaks from the concrete trenches appear to have resulted in the release of a dilute aqueous waste stream containing PCE.

Historical records also revealed that fuel oil was stored in a 55-gallon drum and used to fuel an onsite steam cleaner. Releases of fluids from the wash rack pad and the drop inlet near the office, warehouse and pickle processing building contributed TPH to soil.

The presence of pesticides has been attributed to application during historical agricultural use. The presence of metals in soil, including arsenic and lead, appears consistent with background concentrations in similar geologic strata within the vicinity of the Site. Storm water runoff containing TPH appears to have leaked from the storm drain lines and contributed to the biodegradation of PCE in groundwater.

4.1.2 Chemical Distribution in Groundwater

Once released, the distribution of VOCs in groundwater is controlled primarily by diffusion and dispersion. Diffusion of VOCs in the liquid phase is similar to heat transfer, i.e., movement from hot to cold. VOC transfer by diffusion moves from areas of higher concentration to areas of lower concentration. The flow will be down the concentration gradient, unless limited by convective (pumping forces) or density gradients (gravity). Therefore, the presence of higher concentrations is interpreted to represent a source area.

The highest concentration of VOCs has been found hydraulically upgradient of the Site. In interpreting the Site groundwater data, the relative distribution of higher concentrations of PCE in downgradient wells, MW-1 rather than MW-4 appear potentially inconsistent with the CSM that attributes the presence of PCE to offsite releases. As discussed above, higher concentrations of VOCs would be expected near the source and lower concentrations farther from the source. However, a review of the Site data reveals that the distribution of PCE has been influenced by extraction from the onsite water supply well and biological degradation in the vicinity of MW-2 and MW-3.

4.1.2.1 UPGRADIENT AND OFFSITE PCE RELEASE

A release of PCE has been documented upgradient of the Site (Geotracker, 2006). PCE was reported in groundwater at 60 µg/l approximately 150 feet to the northeast of the Site. The highest onsite PCE concentration was reported at 19.1 µg/l in monitoring well MW-1, approximately 450 feet downgradient from the offsite release. Groundwater elevations measured in the Site monitoring wells and near the Site revealed a groundwater flow direction generally to the west. Therefore, based on the higher upgradient concentrations and the groundwater flow direction, it appears that PCE from the offsite release has migrated beneath the Site.

4.1.2.2 ONSITE WATER SUPPLY WELL

The onsite water supply well was used to supply process water for pickle processing operations. The depth of the onsite water supply was measured at approximately 100 feet below ground surface and appears to be screened across the shallow water-bearing zone. Pumping from the onsite water supply well appears to have extracted groundwater containing PCE from the upgradient source. Thus, the PCE plume was mobilized toward the onsite water supply well at the Site.

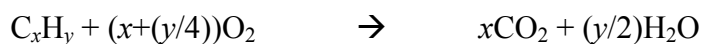
4.1.2.3 BIODEGRADATION

The distribution of PCE has also been affected by biological transformation or biodegradation. Biodegradation refers to the biochemical reactions that are performed by microorganisms (e.g., bacteria). Naturally-occurring microbes can metabolically reduce the mass of VOCs. In this process, the microorganisms also require other nutrients to efficiently perform the transformation. Microbial investigations of the subsurface have revealed that all aquifers examined thus far support a microbial population (USEPA, 1995). Typical microbial populations range from 100,000 to 10,000,000 cells per gram, dry weight. Often the release of organic chemicals results in an increase in the microbial population as the bacteria feed and grow using the new carbon source.

The VOCs, including PCE, can be transformed by chemical and biological processes to form a variety of other compounds, including TCE, DCE and chloroethene (CE). However, PCE chemical transformation processes occur under limited groundwater conditions, i.e., anaerobic and sulfate reducing.

Generally, organic molecules with abundant carbon-hydrogen bonds (i.e. petroleum hydrocarbons) are good electron donors (food sources) because they contain available electrons. VOCs such as PCE, however, are electron poor because they have chlorine-carbon bonds preferred by the bacteria as electron acceptors. During reductive dehalogenation, chlorine atoms are replaced by electrons coupled to hydrogen atoms, resulting in sequential dechlorination from PCE to TCE to DCE.

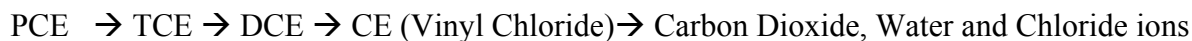
Therefore, one of the requirements for biotransformation of VOCs is the presence of sufficient concentrations of other organics (co-contaminants) that can serve as electron donors for energy metabolism. PCE biodegrades very slowly in water under most conditions. Studies have found limited or no biodegradation under aerobic conditions. Biodegradation under anaerobic conditions has been noted and ranged from very little after 12 weeks to 40 percent after 8 weeks. Therefore, the anaerobic conditions promoted by the presence of petroleum hydrocarbons forms an ideal condition for biological reductive dehalogenation. Under aerobic (oxygen available) environments, a petroleum hydrocarbon compound is oxidized to form carbon dioxide and water.



Under anaerobic conditions, the pathway for reductive dehalogenation by sulfate bacteria is presented below.



Or



Laboratory analysis of groundwater samples collected from the vicinity of the warehouse has revealed the presence of PCE at 7.06 µg/l and TCE at 1.95 µg/l in monitoring well MW-2, located south of the warehouse. Groundwater samples collected from monitoring well MW-3 revealed that PCE has been completely degraded, TCE at 0.82 µg/l and DCE at 7.17 µg/l. TPH has been detected in soil near the drop inlet at the loading dock. Laboratory analysis of groundwater samples collected from monitoring wells MW-1 and MW-4 did not reveal the presence of biological degradation by-products, i.e., TCE and DCE in groundwater. The lack of degradation products is consistent with the lack of petroleum hydrocarbons found in these two areas of the Site.

Therefore, the presence of TCE and DCE in groundwater near the warehouse is explained by the loss of PCE due to biological degradation. The biological degradation has occurred in the presence of storm water containing TPH, which appears to have leaked from the storm drain lines and subsequently infiltrated to groundwater.

4.2 RISK ASSESSMENT

A risk assessment was performed to assist in assessing whether response actions are needed to address Site conditions. The risk assessment consisted of three components: (1) identification of potential exposure pathways; (2) identification of appropriate preliminary remediation goals (PRGs) for each media; and (3) a comparative analysis. The PRGs are the initial or proposed cleanup goals developed to evaluate Site conditions and identify the necessity for response actions. The PRGs are “conservatively calculated threshold values below which particular chemicals are believed to present no significant risk to humans or natural resources that might be exposed to the particular hazardous material” (USEPA, 2004).

Based on the identified exposure pathways, Preliminary Remedial Goals (PRGs) were developed for chemicals in soil, soil gas and groundwater (WEST, 2006a). Chemical specific PRGs were developed from: concentrations based on Applicable or Relevant and Appropriate Requirements (ARARs); To Be Considered (TBCs) criteria including published environmental screening criteria; and concentrations based on site-specific risk assessments.

Concentration-based ARARs for selection of PRGs included the California Department of Health Services (DHS) maximum contaminant levels (MCLs) and Regional Board Basin Plan numerical water quality objectives. TBCs for selection of PRGs included: USEPA Region IX PRGs; CalEPA California Human Health Screening Levels (CHHSLs); and the Office of Environmental Health Hazard Assessment (OEHHA) Public Health Goals (PHGs) and toxicity factors. Where concentration-based ARARs or TBCs were not available, PRGs were developed following procedures as outlined by the USEPA (USEPA, 2004). A summary of the selected PRGs is presented in Table 4-1.

PRGs will be refined into remedial goals (RGs) during the review of the response plan based on community and regulatory agency acceptance. Development of RGs constitutes a core component of the development and screening of potential response actions.

4.2.1 Exposure Pathways Evaluation

Exposure pathways for TPH, organochlorine pesticides and metals in soil; and VOCs in soil gas and groundwater at the Site have been evaluated to assess the potential impacts to human health and the environment. Potential human exposure to TPH, organochlorine pesticides and metals is limited to soil at the Site. Potential human exposure to VOCs is limited to soil gas and groundwater at the Site. Direct exposure to VOCs in groundwater was identified as a complete exposure pathway due to the potential use of the groundwater beneath the Site as a drinking water source.

4.2.1.1 EXPOSURE CONCENTRATIONS

Where sample data were limited, the maximum-detected concentration of the chemicals was compared with the screening levels. Where an adequate number of data points were available, the 95 percent upper confidence level (UCL) of the mean concentration, i.e., the Reasonable Maximum Exposure (RME) was compared with the screening levels, pursuant to CalEPA and USEPA guidance (CalEPA, 1996). CalEPA recommends that maximum beneficial uses of a property be the basis for evaluation, e.g., residential. Therefore, conditions in soil, soil gas and

groundwater at the Site have been screened using the methods described below based on a residential exposure scenario (Appendix D).

4.2.2 Identification of Screening Levels

Based on the identified exposure pathways, PRGs have been selected for chemicals in soil, soil gas and groundwater. The selected PRGs have been selected based on a review of concentration-based ARARs including: DHS Drinking Water MCLs and Regional Board numerical water quality objectives and TBCs including USEPA Regional IX PRGs and CalEPA CHHSLs. Where concentration-based ARARs were not available, PRGs were developed following procedures as outlined by the USEPA (USEPA, 2004).

4.2.2.1 USEPA REGION IX – PRELIMINARY REMEDIAL GOALS

The USEPA Region IX has developed PRGs. PRGs combine current USEPA toxicity values with standard exposure factors to estimate concentrations “in environmental media (soil, air, and water) that are protective of humans, including sensitive groups, over a lifetime” (USEPA, 2004). As outlined by the USEPA, “PRG concentrations presented in the table can be used to screen pollutants in environmental media, trigger further investigation, and provide an initial cleanup goal if applicable.”

When considering PRGs as preliminary goals, USEPA recommends that maximum beneficial uses of a property be the basis for evaluation. The anticipated future use of the Site includes residential development. Therefore, the results have been evaluated with respect to residential PRGs.

4.2.2.2 CHHSLs

The CalEPA has developed California Human Health Screening Levels (CHHSLs). CHHSLs combine standard exposure assumptions and chemical toxicity values published by the USEPA and CalEPA, to estimate soil, soil gas and indoor air concentrations considered to be below

thresholds of concern for risks to human health (CalEPA, 2005). The soil CHHSLs are modeled after the USEPA Region IX PRGs for these media. The primary difference between the CHHSLs and the PRGs is the use of CalEPA-specific toxicity factors in development of the CHHSLs, when available, rather than toxicity factors published by the USEPA. For volatile chemicals, soil gas CHHSLs were developed to evaluate the potential intrusion of subsurface vapors (soil gas) into buildings and subsequent impacts to indoor air. The current and anticipated future use of the Site is residential. Therefore, the results have been evaluated with respect to residential CHHSLs.

4.2.2.3 STATE WATER RESOURCES CONTROL BOARD RESOLUTION 92-49

Pursuant to State Water Resources Control Board (SWRCB) Resolution No. 92-49, groundwater containing concentrations above applicable numerical water quality objectives must obtain the requisite level of water quality within a reasonable timeframe. In general, target cleanup levels for groundwater are based on the numerical water quality objectives as designated in the *Water Quality Control Plan for the San Francisco Bay* or Basin Plan (Regional Board, 2000). The Basin Plan also includes narrative water quality objectives that require that waters “shall not contain taste- or odor-producing substances in concentrations that...adversely affect beneficial uses.”

The groundwater beneath the Site has been designated to have the potential beneficial use of municipal and domestic water supply (MUN). The Basin Plan identifies the drinking water MCLs as numerical water quality objectives for the MUN beneficial use. The DHS has set an MCL for PCE at 5.0 µg/l, TCE at 5.0 µg/l and DCE at 6 µg/l (Cal. Code of Regs., tit. 22, § 64444). The DHS has also established a notification level for 1,4-dioxane of 3 µg/l (DHS, 2005).

4.2.2.4 SOIL LEACHING TO GROUNDWATER

An evaluation was conducted to develop a PRG for TPH in soil that is protective of groundwater quality below its taste and odor threshold. The TPH PRG for protection of groundwater was

derived using a combination of Site-specific and default values in standardized equations presented in *Soil Screening Guidance* (EPA/540/R-95/128 and EPA/540/R-96/018). Chemical transport evaluations were conducted to evaluate the potential impact of TPH in soil on groundwater quality where groundwater beneath the Site is a potential drinking water supply and soil was not covered with asphalt or Portland cement concrete.

The evaluation was performed to simulate the one-dimensional transport of water and TPH through an unsaturated soil column. The calculations used a soil-water partition equation to estimate concentrations of chemicals in infiltrated water. The soil-water partition equation relates concentrations of chemicals adsorbed to soil organic carbon to soil leachate concentrations. The equation allows for the calculation of the soil concentration that corresponds to the target soil leachate concentration. The use of the soil/water partition equation, however, is based on an infinite source of chemicals extending to the top of the aquifer. Therefore, a mass-limit evaluation was also conducted. The mass-limit equation provides for an estimate of the soil concentration that is protective when the entire volume of TPH leaches over the exposure duration. The results of the mass-limit evaluations are compared to the soil/water partition results and the higher of the two values is selected.

The input data to the equation can be grouped into four categories: climatological data, soil data, chemical data and application data. Climatological data was retrieved from the Riskpro Database. The information from the closest climatological station at Oakland Airport was used to obtain necessary input data. Based on the field observation, the soil types at the Site are primarily silts and clays. A representative porosity, bulk density and percent of organic carbon content were used based on Site-specific and default values.

Using the soil data and the *Soil Screening Guidance*, a Site-specific dilution attenuation factor (DAF) was calculated and then used to estimate a concentration of TPH in soil of approximately 100 mg/kg that is protective of groundwater quality below its taste and odor numerical water quality objective of 100 µg/l.

The DAF was estimated based on conservative site-specific information, i.e., hydraulic gradient of 0.004 determined from groundwater elevations measured at Site permanent monitoring wells; water-bearing zone thickness or mixing zone of approximately 0.97 meters (approximately 3 feet) as encountered in borings; estimated lateral extent of TPH present in soil at the Site of approximately 5 meters (15 feet); rain fall infiltration rate in the vicinity of the Site of 0.5 meters; and an estimated aquifer hydraulic conductivity of 1,270 meter per year for similar hydrogeologic materials encountered at the Site (Freeze and Cherry, 1979). Worksheets for calculating the Site-specific DAF and TPH soil concentration protective of groundwater are included in Appendix D.

4.2.2.5 VAPOR INTRUSION TO INDOOR AIR RISK EVALUATION

A concentration-based ARAR for evaluating the potential indoor air risk posed by the presence of 1,4-dioxane in soil gas has not been promulgated. Therefore, based on Site-specific data, a PRG was developed to evaluate the potential risk from migration of soil gas containing 1,4-dioxane to indoor air. The evaluation included using the soil vapor permeability test results to develop an attenuation factor for calculating a PRG for 1,4-dioxane.

The Site-specific data collected included the soil permeability to gas flow testing results (Section 3), which were used to calculate a soil gas to indoor air attenuation factor (α). The attenuation factor (α) is the ratio of the contaminant concentration in the indoor air (C_{in}) to the soil gas concentration (C_g). The following equation was used to calculate the attenuation factor (USEPA, 1992):

$$\alpha = C_{in}/C_g = [(D_t^{eff}A/QL_t) \times \exp(Q_sL_c/D^cA_c)] / [\exp(Q_sL_c/D^cA_c) + (D_t^{eff}A_b/Q_sL_t) + [(D_t^{eff}A/Q_sL)(\exp(Q_sL_c/D^cA_c) - 1)]]$$

The Site-specific soil permeability to gas flow values (k_v) was used to calculate the flow rate of soil gas to the building (Q_s). The flow rate of soil gas to the building (Q_s) was input into the equation to calculate a Site-specific attenuation factor. Based on the Site-specific data collected during the soil permeability to gas flow testing, an attenuation factor for 1,4-dioxane in soil gas

to indoor air (α) was calculated. Worksheets for calculating the Site-specific attenuation factor are included in Appendix D.

The attenuation factor was then used to calculate a PRG for protection of indoor air from 1,4-dioxane in soil gas. The soil gas PRG for 1,4-dioxane was calculated using the following equation:

$$C_{gPRG} [\mu\text{g}/\text{m}^3] = C_{inPRG} [\mu\text{g}/\text{m}^3]/\alpha$$

Therefore, using the California modified cancer slope factor for 1,4-dioxane and the site-specific α of 0.0009, the soil gas PRG for 1,4-dioxane was calculated at approximately 2,500 $\mu\text{g}/\text{m}^3$.

4.2.2.6 BACKGROUND CONCENTRATIONS

Measurable concentrations of metals, including arsenic as well as certain organic compounds may represent background concentrations associated with natural and anthropogenic sources. The USEPA advises that naturally occurring arsenic in soil is frequently higher than the risk-based concentration set at a one-in-one-million cancer risk (the CHHSL for arsenic in residential soil is 0.07 mg/kg). Investigations of background concentrations of arsenic in unconsolidated alluvium of the San Leandro/San Lorenzo Sub-Areas have revealed background concentrations in soil of similar geologic strata at 8.0 mg/kg (D&M, 1989a,b).

4.3 **DEVELOPMENT OF REMEDIAL GOALS**

The laboratory analysis has revealed the presence of COPCs including: TPH, organochlorine pesticides and metals in soil; and VOCs in soil gas and groundwater at the Site. Response action objectives have been developed based upon the current environmental conditions and reasonably anticipated future use of the Site as residential. Based on the response action objectives, remedial goals developed for the Site are protective of both human health and environment. Information used to develop the remedial goals included the soil laboratory analytical data, geologic and hydrogeologic data.

4.3.1 Response Action Objectives

The following response action objectives were identified for the Site:

- protect human health and the environment;
- provide an economically reasonable and technically feasible remedy; and
- achieve a Site that can be permanently used for its planned use without any significant risk to human health or any significant potential for future environmental damage.

4.3.2 Remedial Goals

The remedial goals for the COPCs in soil, soil gas and groundwater have been developed based upon the results of the comparative evaluations between the Site characterization data and the identified applicable screening criteria. The applicable screening criteria were identified based on the anticipated future uses of the Site as residential. The presence of: TPH in soil; PCE and 1,4-dioxane in soil gas; and PCE, TCE and DCE in groundwater has been identified to pose a potential risk to human health and/or the environment under the proposed future land use.

4.3.2.1 SOIL REMEDIAL GOALS

The soil remedial goal for TPH is the resource protection screening criterion of 100 mg/kg. The soil remedial goals for metals are based on residential PRGs, with the exception of arsenic, which is based on the background concentration of less than 8.0 mg/kg. A summary of the soil remedial goals is presented in Table 4-1.

4.3.2.2 SOIL GAS REMEDIAL GOALS

The remedial goal for VOCs in soil gas, including PCE at 180 $\mu\text{g}/\text{m}^3$, are based on the CHHSL protection of indoor air migrating from soil gas. The soil remedial goal for 1,4-dioxane in soil

gas is the California modified indoor air PRG of 2,500 $\mu\text{g}/\text{m}^3$. A summary of the soil gas remedial goals is presented in Table 4-1.

4.3.2.3 GROUNDWATER REMEDIAL GOALS

The remedial goal for PCE, TCE, and DCE in groundwater is 5 $\mu\text{g}/\text{l}$, 5 $\mu\text{g}/\text{l}$ and 6 $\mu\text{g}/\text{l}$, respectively based on the California DHS MCLs. A summary of the groundwater remedial goals is presented in Table 4-1.

4.4 EVALUATION OF FINDINGS

Laboratory analytical results for the soil, soil gas and groundwater samples have been compared to the identified evaluation criteria to assist in identifying conditions of concern. The comparison criteria and the analytical results are summarized in Table 4-1 and discussed below.

4.4.1 Soil Conditions

A review of the Site soil data with respect to the identified screening criteria revealed TPH as a chemical of potential concern. TPH was reported in the vicinity of: the wash rack; and drop inlet located in the loading dock up to 839 mg/kg and 1,370 mg/kg, respectively; which is above the PRG of 100 mg/kg.

4.4.2 Soil Gas Conditions

A review of the soil gas data with respect to the identified screening criteria revealed PCE and 1,4-dioxane as COPCs. PCE in soil gas was reported near of the loading dock at 1,090 mg/kg; above the CHHSL of 180 $\mu\text{g}/\text{m}^3$. 1,4-dioxane in soil gas was reported near the loading dock at 4,370 $\mu\text{g}/\text{m}^3$; above the PRG of 2,500 $\mu\text{g}/\text{m}^3$. A summary of the soil gas remedial goals is presented in Table 4-1.

4.4.3 Groundwater Conditions

A review of the groundwater monitoring well data with respect to the identified screening criteria revealed PCE in groundwater at 19.1 µg/l; above the California DHS MCL of 5 µg/l. TCE in groundwater was reported at 1.95 µg/l; below the California DHS MCL of 5 µg/l. DCE in groundwater was reported at 7.17 µg/l; above the California DHS MCL of 6 µg/l. A summary of the groundwater remedial goals is presented in Table 4-1.

4.5 DATA GAP ANALYSIS

Based on a comparison of the Site data with the CSM and the remedial goals, the data gaps identified in the *Work Plan* have been addressed. A review of the Site soil data revealed that the presence of TPH above its remedial goal is limited to: approximately 20 feet around the wash rack pad (W-13 and W-20); and near the drop inlet located 40 feet east of the loading dock (W-10). A review of the Site soil gas data revealed that the presence of: PCE in soil gas appears limited to the loading dock area; and 1,4-dioxane in soil gas appears limited the immediate vicinity of soil gas sample W-11, located near the warehouse. A review of the Site soil data did not reveal VOCs and pesticides above their respective remedial goals. Metals, including arsenic and lead, were detected in soil samples at concentrations consistent with background for similar geologic strata and were not attributable to anthropogenic sources, e.g., pesticides or lead-based paint. The 95 percent UCL of arsenic and lead in soil was calculated at approximately 7 mg/kg and 35 mg/kg, respectively; below the respective maximum background concentration of 8 mg/kg for arsenic and the PRG for lead of 150 mg/kg.

Based on the Site data, the following data gaps identified in the *Work Plan* have been address.

- The lateral and vertical extent of TPHd in soil has been characterized;
- The presence of lead in soil near the buildings constructed prior to 1978 is consistent with background concentrations within similar geologic strata and not attributable to lead-based paint;

- The presence of pesticides associated with the former grassland areas is consistent with the historical agricultural use of the Site prior to development;
- The nature and extent of the 1,4-dioxane in soil gas is limited;
- Based on the Site groundwater flow data, the presence of PCE in soil gas and groundwater is attributable to an upgradient release and subsequent distribution as process water through pumping of the onsite water supply well and wastewater leaks from the concrete trenches.

Based on the data gap analysis, it does not appear additional investigations are warranted.

5.0 RESPONSE PLAN IMPLEMENTATION

This section identifies the tasks to be conducted for implementation of response actions to address the “unreasonable risk” posed by: TPH in soil; PCE and 1,4-dioxane in soil gas; and PCE and DCE in groundwater at the Site, based on a residential land use scenario. The response actions include: excavation and offsite disposal of soil to address TPH in soil and PCE and 1,4-dioxane in soil gas; and institutional controls to address groundwater-containing VOCs.

5.1 RESPONSE PLAN OBJECTIVES

The objective of the *Response Plan* is to propose actions to reduce the contaminants identified as posing an unreasonable risk to public health and safety or the environment. Based on the characteristics of the chemicals of concern, the nature of the Site and regulatory requirements, a range of general response actions were evaluated and selected to provide an economically reasonable and technically feasible remedy.

5.2 RESPONSE ACTIONS AND PROPOSED REMEDY

5.2.1 Response Actions

Proposed response actions were selected to reduce the concentration of: TPH in soil in the vicinity of the wash rack and loading dock below its PRG of 100 mg/kg; and PCE and 1,4-dioxane in soil gas in the vicinity of the loading dock and former cucumber tank yard below their respective PRGs of 180 $\mu\text{g}/\text{m}^3$ and 2,500 $\mu\text{g}/\text{m}^3$. As groundwater beneath the Site has been designated to have the potential beneficial use of municipal and domestic water supply, response actions were also selected to mitigate potential risks from VOCs in groundwater.

Applicable response actions were evaluated to meet the objectives for the Site. In accordance with the USEPA’s Remedial Investigation/Feasibility Study Guidance Document (USEPA, 1988), response actions were evaluated based on their relative effectiveness, the feasibility of implementing them at the Site, and their respective cost. Based on the identified criteria, the

nature of the chemicals, PRGs and a review of applicable technology screening criteria, the following general response actions were identified for evaluation:

- In-situ treatment of soil and groundwater, including vapor extraction and ozone injection;
- Excavation and offsite disposal of soil containing TPH in soil; and PCE and 1,4-dioxane in soil gas above PRGs;
- Abandonment of the onsite water supply well to minimize the potential vertical migration of groundwater or otherwise transferring of water between permeable zones or aquifers; and to address the potential risk posed by use of the onsite water as a potable supply; and
- Institutional controls and Monitored Natural Attenuation (MNA) to address VOCs in groundwater beneath the Site.

5.2.2 Proposed Remedy

Based on a review of the response actions and their ability to address the potential risk to public health and the environment, the following remedies have been selected to meet the response action objectives:

- Excavation and offsite disposal of soil containing TPH; and PCE and 1,4-dioxane in soil gas;
- Abandonment of the onsite water supply well;
- Institutional controls to address VOCs in groundwater; and
- Groundwater monitoring for VOCs and parameters to document that transformation processes are proceeding and that groundwater remedial goals will be reached within a reasonable time.

The following sections describe the implementation of the proposed remedies, including the response to control any endangerment in the event that further contamination is discovered during implementation of the proposed remedies.

5.2.3 Utility Clearance

Pursuant to California Assembly Bill AB 73, Underground Services Alert (USA) will be contacted to locate utilities entering the Site and a private underground utility locating contractor will be used to identify subsurface utilities on the Site near the areas proposed for excavation and monitoring well abandonment/installation.

5.2.4 Health and Safety Plan

As required by the California Occupational Health and Safety Administration (CalOSHA) Title 8 §5192 *Hazardous Waste Operations and Emergency Response* and the U.S. Occupational Health and Safety Administration (OSHA) 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Responses*, a Site Health and Safety Plan (HASP) has been prepared for use by the contractor and subcontractors while conducting the remediation activities (WEST, 2006b). The contractor will use the HASP that outlines measures to control worker exposure to: TPH in soil; and VOCs in soil gas and groundwater.

5.2.4.1 AIR MONITORING

Respirable dust air monitoring will be performed daily, downwind of Site excavations. Field monitoring for real-time and time-weighted averages (TWA) of airborne particulate concentrations will be recorded using a Monitoring Instruments for the Environment, Inc. (MIE) respirable air monitor (RAM), model PDR-1000. The RAM measures the concentration of airborne particulate matter using a high sensitivity nephelometer (photometer) using a light scatter sensor. Sensitivity of the RAM is reported to range from 0.001 milligrams per cubic meter (mg/m^3) to 400 mg/m^3 . The RAM will be calibrated daily using the RAM calibration pouch. Weather conditions including wind direction will also be recorded daily. If the difference in dust concentrations between the upwind and downwind total dust monitoring levels exceed 0.050 mg/m^3 , additional dust control measures will be implemented. These measures may include applying water to exposed areas of the Site or suspending excavation activities if high wind conditions are causing the excess dust.

A Thermo Instruments Inc., Model 580B, photo-ionization detector (PID) will also be used to monitor organic vapors in air during remedial work. The PID will be calibrated prior to each use with isobutylene standard gas (100 parts per million isobutylene plus or minus 2 percent) according to the procedures outlined in the instrument handbook. The PID field measurements will be recorded in the field notebook of onsite personnel.

5.2.5 Permitting and Agency Approvals

Prior to implementation of the recommended remedial actions, permits will be obtained for the work. The required approvals, permits, and licenses as required by local, state, and federal agencies will be obtained. Permits to be obtained include:

- Grading and Excavation Permit – City of Hayward;
- Bulkwater Permit – City of Hayward;
- Notice of Demolition and Renovation – Bay Area Air Quality Management District (BAAQMD);
- Well Abandonment and Installation Permits – Alameda County Public Works Agency; and
- Notice of Intent (NOI) to obtain coverage under the General Construction Storm Water Permit – State Water Resources Control Board (SWRCB).

In addition, adjacent residents and businesses will be notified of the scheduled work dates approximately one week prior to commencing excavation.

5.2.6 Soil Response

The volume of soil containing TPH, PCE and 1,4-dioxane, above PRGs has been estimated at approximately 600 cubic yards, subject to field testing. The recommended soil response action is the excavation of soil above PRGs with offsite disposal. Based on the existing analytical data, the anticipated limits of excavation are presented on Figure 5-1.

5.2.6.1 SOIL EXCAVATION, HANDLING, TRANSPORT AND DISPOSAL

Approximately 300 cubic yards of soil will be excavated to approximately three-feet below ground surface near the wash rack and the drop inlet near the loading dock to remove TPH in soil above the PRG of 100 mg/kg. Approximately 300 cubic yards of soil will be excavated to approximately eight-feet below ground surface in the vicinity of the loading dock and cucumber tank yard, to remove PCE and 1,4-dioxane in soil gas above their respective PRGs of 180 $\mu\text{g}/\text{m}^3$ and 2,500 $\mu\text{g}/\text{m}^3$. The excavation depth is based on the measured or estimated depth to attain soil or soil gas concentrations below their respective PRGs.

The excavation slopes will be three horizontal to one vertical or flatter and hence, should not require shoring. Equipment that will be used to excavate and handle the soil will include a combination of, but not limited to, an excavator, dozer and front end loader. The excavation work is scheduled to occur between 7:00 AM and 7:00 PM in accordance with the City of Hayward Municipal Code.

The excavation will be advanced vertically and horizontally within the excavation boundaries until affected soil has been removed to below remedial goals based on field screening, soil sampling analytical results and statistical analysis of the data. Following the completion of excavation activities, the excavations will be backfilled, compacted, and graded to restore the ground surface. Details of the field sampling procedures and quality assurance/quality controls are provided in the Sampling and Analysis Plan (SAP) presented in Appendix E. Because the groundwater table is estimated at approximately 16 feet below ground surface, dewatering activities are not anticipated.

Soil excavated from soil response areas with chemicals of concern (COCs) above remedial goals will be: directly loaded into trucks for offsite disposal; or stockpiled and sampled prior to offsite disposal. The excavated soil will be disposed at Class I, Class II or Class III landfills, as appropriate. Equipment used to transport soil will include transfer trailers or end-dump trailers with tarpaulin covers for dust control, in accordance with the Transportation Plan (Appendix F).

Pursuant to the requirements of AB 939 requirements, the Portland cement concrete and asphaltic concrete will be segregated from the soil for reclamation. Six to 12-inches of ground cover, including asphalt pavement and concrete, will be removed and direct hauled separately from soil containing COCs above remedial goals.

5.2.6.2 DUST CONTROL

Dust control will be performed by applying water with a low-pressure spray system. Low volumes of potable water will be routinely spread in areas where dust may be generated because of remediation activities. Water for dust control will be obtained from a City of Hayward fire hydrant.

Additional dust control measures include the following:

- Soil stockpiles, if created, will be covered when they are not being worked on and at the end of each day;
- When loading trucks, drop heights will be minimized to reduce the potential for dust generation;
- Public streets will be swept daily if soil is visible from onsite soil movement activities; and
- Excavation and loading activities will be suspended if high wind conditions prevent proper maintenance of dust control.

5.2.6.3 EQUIPMENT DECONTAMINATION

Prior to exiting the work zone and Site, e.g., crossing public thoroughfares or completion of excavation, the excavator and loader will be cleaned. The trucks and equipment will be dry brushed for removal of material from the truck body and tires prior to exiting the Site. Trucks

exiting the Site will also be inspected and logged for compliance with the Site decontamination requirements.

5.2.6.4 PRE-DISPOSAL SOIL PROFILING

Prior to disposal, the excavated soil will be profiled for acceptance at a suitable waste management facility. If there is insufficient data to allow direct hauling of the soil from the excavation, additional soil samples will be collected prior to offsite transportation, e.g., the soil will be stockpiled, sampled and profiled prior to disposal.

In the event that soil is stockpiled prior to profiling and disposal, the stockpiled areas will be bermed and covered with plastic sheeting to: prevent storm water erosion and/or runoff; and to minimize airborne particulate emissions. Stockpile heights will not exceed 15 feet. Stockpiles will be covered each evening at the close of work, and any portions of the stockpile not being actively worked on a given day will remain covered with plastic sheeting. Plastic sheeting will be held in place by concrete, sandbags or other appropriate weighted material.

5.2.6.5 DISCOVERY OF PREVIOUSLY UNCHARACTERIZED MATERIALS

In the event that previously uncharacterized materials are observed in the soil during excavation activities, samples will be collected and analyzed. Prior to proceeding with sampling, notification will be provided to the DTSC. The depth, number and suite of analyses will be determined in coordination with the DTSC and the waste management facilities. If the laboratory analysis reveals chemicals that do not have remedial goals as outlined in the *Response Plan*; and if the concentrations of the new COCs are above appropriate screening levels such as CalEPA CHHSLs or USEPA Region IX residential PRGs; remedial goals will be calculated for these chemicals based on a residential use scenario. If supplemental response actions appear to be warranted, based on a comparison of the analytical testing and PRGs, this material will be removed to achieve the PRGs in accordance with the excavation and confirmation sampling requirements outlined in this Response Plan or a supplemental response plan will be developed and presented to the DTSC for review and approval.

5.2.6.6 STORM WATER MANAGEMENT PLAN

Storm water pollution control procedures will be implemented to comply with the requirements of the California State Water Resources Control Board (SWRCB) Water Quality Order 99-08-DWQ, the *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity* (“the General Permit”). Water pollution control measures to be implemented include, where necessary: 1) berming the site to contain run-off; 2) installation of storm drain filters to remove sediments prior to discharge; and 3) installation of hay bales at appropriate locations to contain storm water run-off and to enhance settling of solids. Details of the contractor’s storm water management requirements, which include Best Management Practices for control of storm water run-on and runoff at the Site, will be outlined in the *Storm Water Pollution Prevention Plan* which will be submitted to DTSC prior to implementation of this Response Plan.

5.2.7 **Groundwater Response**

The response actions to address offsite contributions of PCE to groundwater beneath the Site includes: abandonment of the onsite water supply well; institutional controls through the use of a *Covenant and Environmental Restriction on Property*; and groundwater monitoring of VOCs.

5.2.7.1 WELL ABANDONMENT

The response actions includes the abandonment of the onsite water supply well pursuant Department of Water Resources (DWR) Bulletin 74-90 (DWR, 1991). Prior to well abandonment, four additional depth-discrete groundwater samples will be collected. The water supply well will be abandoned under the supervision of a C-57 licensed well drilling contractor and the oversight of a California Registered Geologist. A well abandonment permit will be obtained from the Alameda County Public Works Agency and documentation of the well abandonment will be forwarded to the regulatory agencies following completion.

5.2.7.2 INSTITUTIONAL CONTROLS

The offsite contribution of PCE and DCE to groundwater beneath the Site will be addressed using a *Covenant and Environmental Restriction on Property* (CERP). The CERP will be designed so that future owners will not have direct contact with the shallow groundwater unless permitted in writing by the DTSC. The CERP will include language that indicates owners or occupants of the property should not drill, bore, otherwise construct, or use a well for the purpose of extracting water for any use, including, but not limited to, domestic, potable, or industrial uses, unless expressly permitted in writing by the DTSC. It will also require access to and non-interference with the groundwater-monitoring network.

An *Operations and Maintenance Plan* (“O&M Plan”) will be prepared that outlines provisions for the management of extracted groundwater as well as health and safety guidelines for future onsite workers. The O&M Plan, submitted under separate cover, includes the following elements: Site inspection; groundwater monitoring; emergency response measures; repairs; corrective actions; and reporting.

5.2.7.3 GROUNDWATER MONITORING

A groundwater-monitoring program is included as a response action to address contributions of PCE from an offsite source. Groundwater samples will initially be collected quarterly to monitor the chemical concentration as a function of season and groundwater levels. After one year of quarterly groundwater monitoring, the monitoring frequency will be re-evaluated based on a review of the analytical data.

Groundwater samples will be collected from the monitoring wells, MW-1 to MW-4, using low flow sampling techniques (USEPA, 1996). During purging, groundwater parameters including pH, dissolved oxygen, temperature, electrical conductivity and turbidity will be measured to monitor stability of parameters indicating the presence of formation water. Following purging of the groundwater, samples will be collected into laboratory supplied containers and transported to

a DHS, ELAP certified laboratory pursuant to ASTM D 4840 chain-of-custody protocols. The groundwater samples will be analyzed for VOCs using USEPA Method 8260.

5.2.8 Public Comment

Pursuant to Subsection 25395.96 of the California Health and Safety Code, public participation will provide opportunities for the public, DTSC and other agencies to participate in decisions regarding the response actions. The methods for public participation will include:

- Publishing a public notice;
- Preparing and distributing a Fact Sheet to interested parties describing the proposed response measures;
- Providing access to the *Response Plan* at the Hayward Public Library; and, if necessary
- Providing a public meeting.

5.2.9 Response Completion Report

Subsequent to the remedial activities described, a *Response Completion Report* summarizing the findings of the analytical testing and other pertinent data will be prepared for review and approval. The report will include:

- Introduction and executive summary; including response objectives, response actions, and any changes to the response design or field activities;
- Results of the confirmation sampling soil and soil gas analytical data; including excavation and sample location figures, laboratory certificates and copies of the chain-of-custody forms;
- Records of response activities, including field sampling sheets; and
- Records of waste management, including waste manifests.

The *Response Completion Report* will be prepared under the supervision of a California Registered Civil Engineer with appropriate qualifications.

5.2.10 Schedule

Excavation is anticipated to begin the week of June 5, 2006. Abandonment of the existing water supply well is also scheduled for the week of June 5, 2006. The *Response Plan Completion Report* is scheduled for submittal to DTSC on July 17, 2006. Figure 5-2 depicts the schedule for implementation of the soil and groundwater response actions.

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7.0 DISTRIBUTION LIST

Mr. David Chapman
LaVista, LLC
11555 Dublin Boulevard
Dublin, California 94568

Ms. Janet Naito
California Environmental Protection Agency
Department of Toxic Substances Control
700 Heinz Avenue, Suite 200
Berkeley, CA 94710-2721

Hayward Public Library
835 C Street
Hayward, CA 94541

Ms. Leah Goldberg
Meyers Nave
555 12th Street, Suite 1500
Oakland, CA 94607

TABLE 2-1
SUMMARY OF GROUNDWATER ELEVATION DATA
22958 Saklan Road
Hayward, California

Well ID	Date Measured	Top of Casing Elevation	Depth to Water	Groundwater Elevation
		(feet MSL)	(feet)	(feet MSL)
MW-1	3/3/06	41.64	15.33	26.31
MW-2	3/3/06	42.22	16.05	26.17
MW-3	3/3/06	43.48	16.12	27.36
MW-4	3/3/06	44.98	16.81	28.17

Notes:

feet MSL: feet above Mean Sea Level (North American Vertical Datum 1988)

TABLE 3-1
SUMMARY OF SOIL ANALYTICAL RESULTS - TPH and VOCs
22958 Saklan Road
Hayward, California

Sample ID	Date	Depth (feet)	Petroleum Hydrocarbons			Volatile Organic Compounds				
			TPHd	TPHmo	TPHg	PCE	1,1,1-TCA	Benzene	Toluene	4-Isopropyltoluene
			(mg/kg)	(mg/kg)	(mg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
W-2	3/4/05	1	10.5	--	<1.00	--	--	--	--	--
W-3	3/4/05	0.5	<10.0	--	<1.00	--	--	--	--	--
W-4	3/4/05	0.5	<10.0	--	<1.00	--	--	--	--	--
W-5	3/4/05	1	<10.0	--	<1.00	--	--	--	--	--
W-6	3/4/05	1	20.3	--	<1.00	--	--	--	--	--
W-10	3/4/05	0.5	184	--	<1.00	--	--	--	--	--
W-13	3/4/05	0.5	849	--	<1.00	--	--	--	--	--
W-14	3/3/05	0.5	10.2	--	<1.00	--	--	--	--	--
W-16	3/4/05	1	<10.0	--	<1.00	--	--	--	--	--
W-18	3/2/06	1	<10.0	<10.0	--	--	--	--	--	--
		3	<10.0	<10.0	--	--	--	--	--	--
W-19	3/2/06	1	<10.0	<10.0	--	--	--	--	--	--
		3	<10.0	<10.0	--	--	--	--	--	--
W-20	3/2/06	1	<400	1,370	--	--	--	--	--	--
		3	<10.0	<10.0	--	--	--	--	--	--
W-21	3/2/06	1	<10.0	11.2	--	<1.39	<1.39	<1.39	<1.39	<1.39
		3	<10.0	<10.0	--	<1.31	<1.31	<1.31	<1.31	<1.31
W-22	3/2/06	1	<10.0	20.6	--	<2.21	<2.21	<2.21	<2.21	<2.21
		3	<10.0	<10.0	--	<1.38	<1.38	<1.38	<1.38	<1.38
W-23	3/2/06	1	<10.0	<10.0	--	1.81	1.80	<1.20	<1.20	<1.20
		3	<10.0	<10.0	--	2.75	1.59	<1.26	<1.26	<1.26
W-24	3/2/06	1	--	--	--	9.07/7.0	<1.43/<2.0	<1.43/<2.0	<1.43/<2.0	<1.43/<2.0
		3	--	--	--	2.8/6.1	<1.26/<2.0	<1.26/<2.0	<1.26/<2.0	<1.26/<2.0
W-25	3/2/06	1	--	--	--	<1.49	<1.49	<1.49	<1.49	<1.49
		3	--	--	--	2.66	<1.28	<1.28	<1.28	<1.28
W-26	3/2/06	1	--	--	--	5.58	<1.41	<1.41	<1.41	<1.41
		3	--	--	--	10.1	<1.48	<1.48	<1.48	<1.48

TABLE 3-1
SUMMARY OF SOIL ANALYTICAL RESULTS - TPH and VOCs
22958 Saklan Road
Hayward, California

Sample ID	Date	Depth (feet)	Petroleum Hydrocarbons			Volatile Organic Compounds				
			TPHd	TPHmo	TPHg	PCE	1,1,1-TCA	Benzene	Toluene	4-Isopropyl toluene
			(mg/kg)	(mg/kg)	(mg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
W-28	3/2/06	1	--	--	--	<3.11	<3.11	<3.11	<3.11	4.31
		3	--	--	--	<1.27	<1.27	1.40	1.48	<1.27
W-31	3/2/06	1	--	--	<1.00	--	--	<1.57	<1.57	--
		3	--	--	<1.00	--	--	<2.50	<2.50	--
PRGs			100	100	100	87	7,800	44	2,857	--

Notes:

<1.00: less than the laboratory-reporting limit.

TPH: total petroleum hydrocarbons as diesel (TPHd), as motor oil (TPHmo), and as gasoline (TPHg)

--: not analyzed

µg/kg: micrograms per kilogram

mg/kg: milligrams per kilogram

PRGs: Preliminary remediation goals

TABLE 3-2
SUMMARY OF SOIL ANALYTICAL RESULTS -- Pesticides, PCBs and Metals
22958 Saklan Road
Hayward, California

Sample ID	Date	Depth (feet)	Pesticides		PCBs	Metals and Metalloids																	pH
			Chlordane	Total DDT		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	
			µg/kg	µg/kg		mg/kg																	
W-1	3/3/05	1.5	93.0	<10.0	--	<2.5	6.88	126	<2.5	<2.5	40.0	12.7	36.9	20.8	0.112	<2.5	46.9	<2.5	<2.5	<2.5	61.9	75.4	7.95
W-2	3/4/05	1	<50.0	<10.0	<100	--	7.26	--	--	--	--	--	--	3.57	--	--	--	--	--	--	--	--	8.65
W-3	3/4/05	0.5	<50.0	<10.0	<100	--	7.2	--	--	--	--	--	--	13.5	--	--	--	--	--	--	--	--	8.14
W-4	3/4/05	0.5	<50.0	<10.0	<100	<2.5	5.85	149	<2.5	<2.5	44.0	10.4	29.4	28.4	0.147	<2.5	40.9	<2.5	<2.5	<2.5	42.8	63.4	8.02
W-5	3/4/05	1	<50.0	74.4	<100	--	7.15	--	--	--	--	--	--	30.2	--	--	--	--	--	--	--	--	7.97
W-6	3/4/05	1	<50.0	<10.0	<100	--	5.39	--	--	--	--	--	--	8.77	--	--	--	--	--	--	--	--	8.49
W-7	3/3/05	0.5	<50.0	<10.0	<100	--	3.15	--	--	--	--	--	--	<2.5	--	--	--	--	--	--	--	--	8.60
W-8	3/3/05	1	--	--	--	--	4.71	--	--	--	--	--	--	155	--	--	--	--	--	--	--	--	7.97
W-9	3/3/05	1.5	<50.0	21.2	<100	--	6.50	--	--	--	--	--	--	16.5	--	--	--	--	--	--	--	--	7.66
W-10	3/4/05	0.5	<50.0	<10.0	<100	<2.5	3.07	45.0	<2.5	<2.5	57.0	18.1	81.1	2.50	0.127	<2.5	42.0	<2.5	<2.5	<2.5	102	40.9	8.90
W-13	3/4/05	0.5	<50.0	10.7	<100	<2.5	5.51	109	<2.5	<2.5	39.8	8.08	20.3	11.9	<0.1	<2.5	37.2	<2.5	<2.5	<2.5	35.8	54.2	7.69
W-14	3/3/05	0.5	<50.0	<10.0	<100	--	5.73	--	--	--	--	--	--	12.9	--	--	--	--	--	--	--	--	8.43
W-16	3/4/05	1	<50.0	<10.0	<100	<2.5	3.79	271	<2.5	<2.5	75.9	22.5	61.1	76.5	0.360	<2.5	46.7	<2.5	<2.5	<2.5	74.0	107	7.68
P-10	1/25/06	1	--	--	--	--	--	--	--	--	--	--	--	6.53	--	--	--	--	--	--	--	--	--
P-13	1/25/06	1	--	--	--	--	--	--	--	--	--	--	--	5.73	--	--	--	--	--	--	--	--	--
P-14	1/25/06	1	--	--	--	--	--	--	--	--	--	--	--	49.0	--	--	--	--	--	--	--	--	--
P-17	1/25/06	1	--	--	--	--	--	--	--	--	--	--	--	37.1	--	--	--	--	--	--	--	--	--
P-19	1/25/06	1	--	--	--	--	--	--	--	--	--	--	--	4.78	--	--	--	--	--	--	--	--	--
P-23	1/25/06	1	--	--	--	--	--	--	--	--	--	--	--	8.29	--	--	--	--	--	--	--	--	--
W-26	3/2/06	3	<50.0	219.4	--	<2.50	10.7	242	<2.50	<2.50	78.5	17.3	35.3	10.8	<0.100	<2.50	77.9	<2.50	<2.50	<2.50	55.3	86.7	--
		5	<50.0	<10.0	--	<2.50	6.31	211	<2.50	<2.50	73.9	11.5	29.6	6.61	<0.100	<2.50	65.6	<2.50	<2.50	<2.50	41.4	73.5	--
W-27	3/2/06	3	<50.0	<10.0	--	--	8.72	--	--	--	--	--	--	9.54	--	--	--	--	--	--	--	--	--
		5	<50.0	<10.0	--	--	6.69	--	--	--	--	--	--	6.30	--	--	--	--	--	--	--	--	--
PRGs			430	1,600	221	31.0	8.0 ¹	5,400	150	37	100,000	900	3,100	150	23	390	1,600	390	390	5.2	78	2,300	--

Notes: Total DDT: composed of dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethane (DDD) and dichlorodiphenyldichloroethene (DDE)
PCBs: polychlorinated biphenyls
PRGs: Preliminary remediation goals
µg/kg: micrograms per kilogram
mg/kg: milligrams per kilogram
S.U.: standard units
--: not analyzed
<1.00: less than the laboratory-reporting limit.
1: background arsenic concentrations (D&M,1989a,b).

TABLE 3-3
SUMMARY OF ACTIVE SOIL GAS ANALYTICAL RESULTS
22958 Saklan Road
Hayward, California

Sample ID	Date	Depth (feet)	Volatile Organic Compounds												
			PCE	TCE	DCE	CE	TCA	Chloro-methane	Freon 12	1,4-Dioxane	TCM	Benzene	Toluene	Xylenes	1,2,4-Trimethylbenzene
			(µg/m ³)												
W-1	3/3/05	3	15.9	<5.37	<3.97	<2.56	<5.46	2.79	<4.95	<3.60	<4.88	8.11	9.7	4.95	<4.92
W-2	3/3/05	3	<13.6	19.6	21.2	10.9	<10.9	<4.13	104	<7.21	<9.77	34.9	9.19	<8.68	<9.83
W-7	3/3/05	3	<6.78	<5.37	<3.97	<2.56	<5.46	<2.07	<4.95	232	20.1	24.2	9.68	<4.34	<4.92
W-8	3/3/05	3	22.0	13.9	<3.97	<2.56	70.1	2.5	<4.95	<3.60	11.0	5.21	10.3	4.65	<4.92
W-9	3/3/05	3	<6.78	<5.37	34.8	<2.56	<5.46	3.80	<4.95	<3.60	<4.88	39.6	12.4	8.81	<4.92
W-10	3/3/05	3	76.9	15.9	<3.97	<2.56	18.3	6.98	<4.95	<3.60	48.0	17.6	5.95	<4.34	<4.92
W-11	3/3/05	3	26.0	<5.37	<3.97	<2.56	<5.46	13.1	<4.95	4,370	<4.88	38.0	37.6	9.20	<4.92
W-12	3/3/05	3	172	<5.37	<3.97	<2.56	10.8	<2.07	<4.95	76.6	<4.88	6.52	4.79	<4.34	<4.92
W-17	3/3/05	3	17.1	<5.37	<3.97	<2.56	<5.46	<2.07	<4.95	<3.60	9.57	8.31	4.86	<4.34	<4.92
W-21	3/2/06	5	<6.78	<5.37	<3.97	<2.56	<5.46	<2.07	<4.95	<7.21	<4.88	8.47	7.42	4.95	<4.92
W-22	3/2/06	5	<17.0	<13.4	<9.91	<6.39	<13.6	<5.16	<12.4	<18.0	<12.2	8.59	<9.42	<10.9	<12.3
W-23	3/2/06	5	<6.78	<5.37	<3.97	<2.56	31.6	<2.07	<4.95	<7.2	<4.88	7.16	5.99	5.77	<4.92
W-24	3/2/06	5	1,090/ 977	34.4/ 29.6	<3.97/ <3.97	<2.56/ <2.56	10.1/ 10.1	<2.07/ <2.07	<4.95/ <4.95	218	10.0/ 9.52	8.43/ 8.05	9.04/ 7.57	11.1/ 8.77	7.28/ 4.92
W-25	3/2/06	5	33.6	5.86	<3.97	<2.56	21.5	<2.07	<4.95	<7.1	<4.88	10.3	9.19	4.56	<4.92
W-28	3/2/06	5	<33.9	<26.9	<19.8	<12.8	<27.3	<10.3	<24.7	<36.0	<24.4	43.1	<18.8	<21.7	<24.6
W-30	3/2/06	5	<17.0	<13.4	<9.91	<6.39	<13.6	<5.16	<12.4	56.2	16.4	25.8	<9.42	<10.9	<12.3
W-31	3/2/06	5	<17.0	<13.4	<9.91	<6.39	<13.6	<5.16	<12.4	1,610	36.6	20.6	<9.42	<10.9	<12.3
PRGs			180	528	15,900	13	991,000	--	--	2,500	--	36.2	135,000	315,000	--

Notes:

PCE: tetrachloroethene	µg/m ³ : micrograms per cubic meter
TCE: trichloroethene	<5.46: Less than the laboratory-reporting limit.
DCE: cis-1,2-dichloroethene	--: not analyzed
CE: chloroethene	PRGs: Preliminary remediation goals
TCA: 1,1,1-trichloroethane	
TCM: trichloromethane	
Freon 12: synonym is dichlorodifluoromethane	

TABLE 3-4
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
22958 Saklan Road
Hayward, California

Sample ID	Date	Petroleum Hydrocarbons		Volatile Organic Compounds									
		TPHg	TPHd	PCE	TCE	Cis-1,2-DCE	Trans-1,2-DCE	1,4-Dioxane	Benzene	Toluene	Ethyl benzene	Xylenes	MTBE
		(mg/l)		(µg/l)									
Temporary Wells													
W-1	3/3/05	<0.050	<0.0500	10.4	<0.500	<0.500	<0.500	<50.0	<0.500	<0.500	<0.500	<0.500	<0.500
W-7	3/3/05	<0.050	<0.0500	14.9	<0.500	<0.500	<0.500	<50.0	<0.500	<0.500	<0.500	<0.500	<0.500
W-9	3/3/05	<0.050	<0.0500	1.07	4.83	5.53	1.64	<50.0	<0.500	<0.500	<0.500	<0.500	<0.500
W-11	3/3/05	<0.050	<0.0500	20.6	<0.500	<0.500	<0.500	<50.0	<0.500	<0.500	<0.500	<0.500	<0.500
W-12	3/4/05	<0.050	<0.0500	23.2	<0.500	<0.500	<0.500	<50.0	<0.500	<0.500	<0.500	<0.500	<0.500
W-15	3/3/05	<0.050	<0.0500	<0.500	<0.500	<0.500	<0.500	<50.0	<0.500	<0.500	<0.500	<0.500	<0.500
W-28	3/2/06	--	--	16.8	0.650	<0.500	<0.500	--	<0.500	<0.500	<0.500	<0.500	--
W-29	3/2/06	--	--	<0.500	<0.500	<0.500	<0.500	--	<0.500	<0.500	<0.500	<0.500	--
W-30	3/2/06	--	--	16.4	0.640	<0.500	<0.500	--	<0.500	<0.500	<0.500	<0.500	--
Monitoring Wells													
MW-1	3/3/06	--	--	19.1/14	0.500/<1.0	<0.500/<1.0	<0.500/<1.0	<3.00	0.500/<1.0	0.500/<1.0	0.500/<1.0	0.500/<1.0	--
MW-2	3/3/06	--	--	7.06	1.95	<0.500	<0.500	<3.00	<0.500	<0.500	<0.500	<0.500	--
MW-3	3/3/06	--	--	<0.500	0.820	7.17	0.620	<3.00	<0.500	<0.500	<0.500	<0.500	--
MW-4	3/3/06	--	--	6.64	<0.500	<0.500	<0.500	<3.00/<2.0	<0.500	<0.500	<0.500	<0.500	--
PRGs		0.100	0.100	5	5	6	10	3	1	42	29	17	5

Notes:

TPHg: total petroleum hydrocarbons as gasoline

TPHd: total petroleum hydrocarbons as diesel

PCE: tetrachloroethene

TCE: trichloroethene

DCE: cis-1,2-dichloroethene

MTBE: methyl tert-butyl ether

mg/l: milligrams per liter

µg/l: micrograms per liter

PRGs: Preliminary remediation goals

<0.500: less than the laboratory-reporting limit

--: not analyzed

TABLE 3-5
SUMMARY OF PASSIVE SOIL GAS ANALYTICAL RESULTS
22958 Saklan Road
Hayward, California

Sample ID	Date Emplaced	Date Retrieved	Depth (feet)	Chlorinated Volatile Organic Compounds						Petroleum Hydrocarbons				
				PCE	TCE	DCE	TCA	1,4-Dioxane	1,1-DCA	Benzene	Toluene	Ethyl Benzene	Xylenes	1,2,4-Trimethylbenzene
				(ng/sampler)						(ng/sampler)				
P-1	1/25/06	2/15/06	1	661	81	<25	<25	<25	<25	<25	<25	<25	<25	<25
P-2	1/25/06	2/15/06	1	<25	<25	<25	<25	<25	<25	<25	216	173	<25	<25
P-3	1/25/06	2/15/06	1	<25	<25	<25	<25	<25	<25	<25	43	<25	<25	<25
P-4	1/25/06	2/15/06	1	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
P-5	1/25/06	2/15/06	1	60	<25	<25	<25	<25	<25	<25	28	<25	<25	<25
P-6	1/25/06	2/15/06	1	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
P-7	1/25/06	2/15/06	1	32	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
P-8	1/25/06	2/15/06	1	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
P-9	1/25/06	2/15/06	1	<25	<25	<25	<25	<25	<25	<25	33	<25	72	<25
P-10	1/25/06	2/15/06	1	893/924	<25/<25	<25/<25	1,838/1,862	<25	<25/<25	<25/<25	38/38	<25/<25	<25/<25	<25/<25
P-11	1/25/06	2/15/06	1	80	<25	<25	<25	<25	<25	36	153	36	184	<25
P-12	1/25/06	2/15/06	1	63	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
P-13	1/25/06	2/15/06	1	146	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
P-14	1/25/06	2/15/06	1	<25	<25	<25	<25	<25	<25	<25	35	<25	<25	<25
P-15	1/25/06	2/15/06	1	111	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
P-16	1/25/06	2/15/06	1	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
P-17	1/25/06	2/15/06	1	<25	<25	<25	<25	<25	<25	28	<25	<25	<25	<25
P-18	1/25/06	2/15/06	1	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
P-19	1/25/06	2/15/06	1	75	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
P-20	1/25/06	2/15/06	1	122	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
P-21	1/25/06	2/15/06	1	29	175	<25	<25	<25	<25	<25	45	<25	35	<25
P-22	1/25/06	2/15/06	1	148	<25	<25	71	<25	<25	<25	28	<25	<25	<25
P-23	1/25/06	2/15/06	1	<25	36	<25	1,698	<25	79	38	56	<25	101	103
Trip Blank	--	--	--	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25

Notes:

PCE: tetrachloroethene
TCE: trichloroethene
DCE: cis-1,2-dichloroethene

ng: nanograms
<25: less than the laboratory-reporting limit
38/38: primary sample results/duplicate sample result

TCA: 1,1,1-trichloroethane
DCA: dichloroethane

TABLE 3-6
SUMMARY OF SOIL PROPERTIES
22958 Saklan Road
Hayward, California

Sample ID	Date	Depth (feet)	Dry Bulk Density	Organic Carbon	Soil Moisture
			(lb/ft ³)	(percent)	(percent)
W-24	3/2/06	3	100.9	0.02	16.4 / 17.72
W-25	3/2/06	3	107.8	0.14	19.1 / 18.38
W-28	3/2/06	3	112.6	0.22	16.4 / 15.34
95 Percent UCL of the mean			117.0	0.30	19.3

Notes:

lb/ft³ Pounds per cubic foot

UCL: Upper Confidence Limit

TABLE 3-7
SUMMARY OF GROUNDWATER MONITORING WELL CONSTRUCTION DETAILS
22958 Saklan Road
Hayward, California

Well ID	Monitoring Well Construction Details						
	Date Installed	Well Diameter	Total Depth	Screen Interval	Sand Pack Interval	Bentonite Seal	Grout Seal
		(inches)	(ft. bgs)	(ft. bgs)	(ft. bgs)	(ft. bgs)	(ft. bgs)
MW-1	3/1/06	0.75	27	12 to 27	11 to 12	9 to 11	0 to 9
MW-2	3/2/06	0.75	27	12 to 27	11 to 12	9 to 11	0 to 9
MW-3	3/1/06	0.75	27	12 to 27	11 to 12	9 to 11	0 to 9
MW-4	3/1/06	0.75	27	12 to 27	11 to 12	9 to 11	0 to 9

Notes:

ft. bgs: feet below ground surface

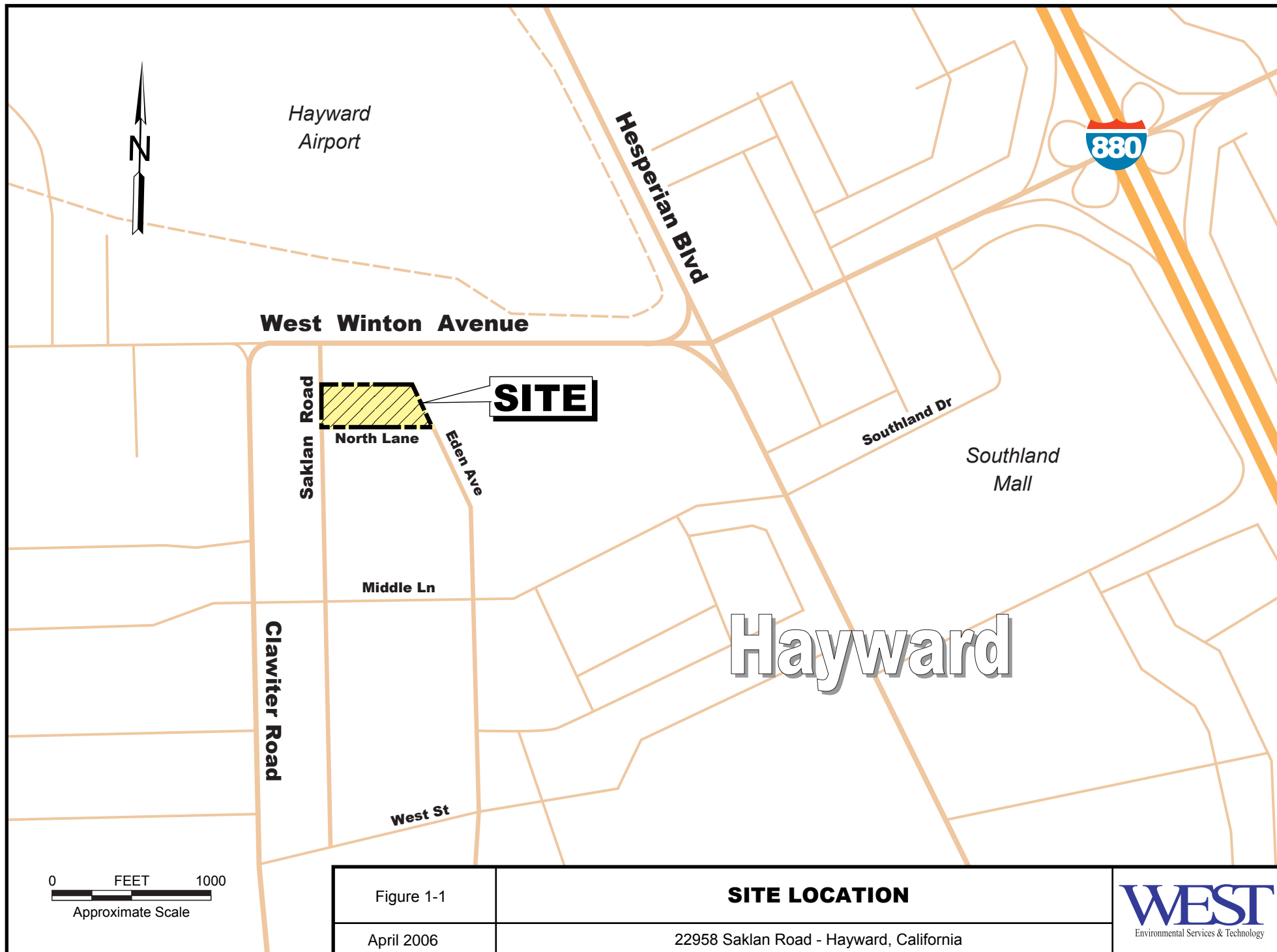
TABLE 4-1
SUMMARY OF REMEDIATION GOALS
22958 Saklan Road
Hayward, California

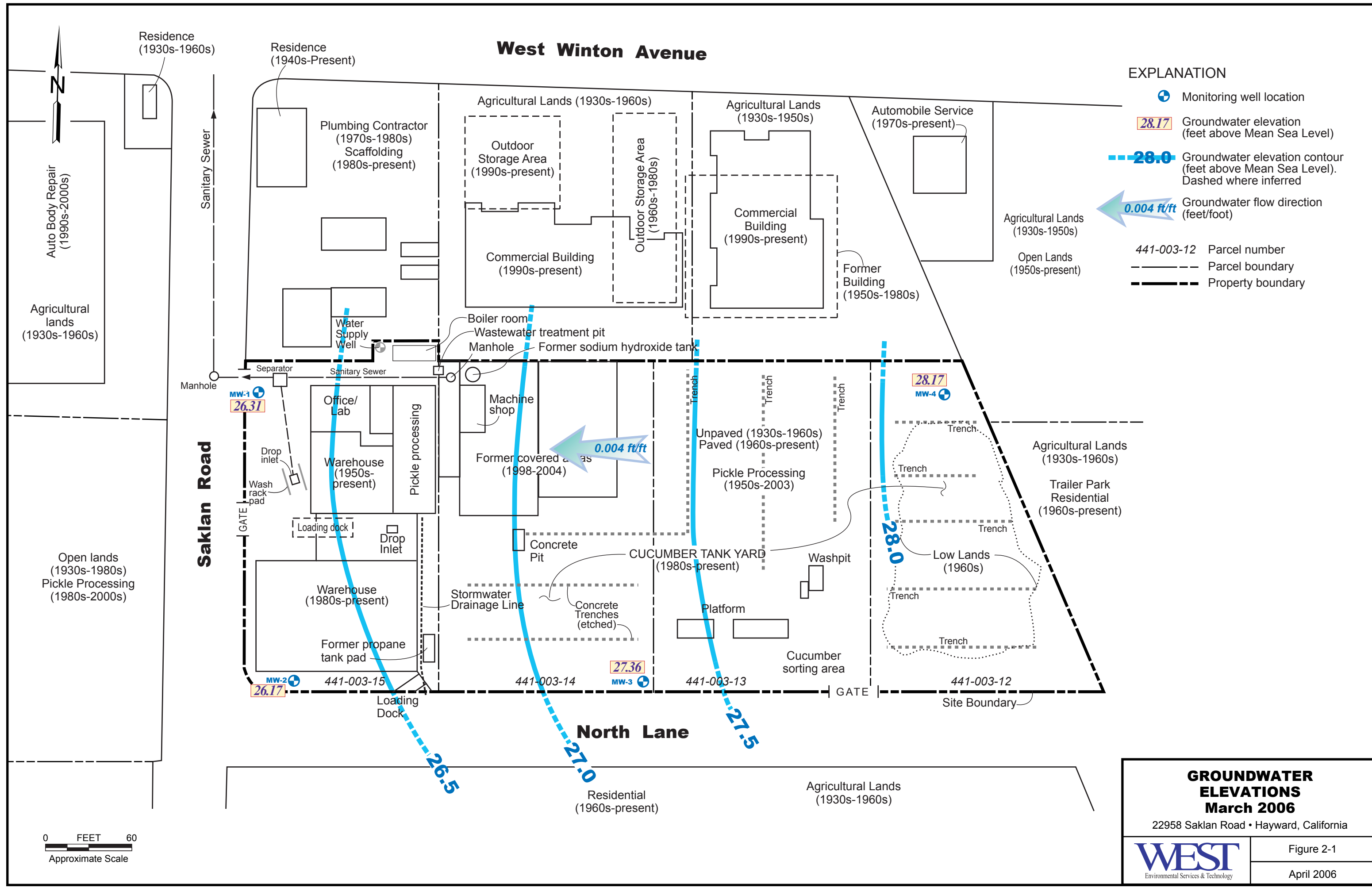
Chemical of Concern	RME Concentration	PRGs
<i>Soil</i>	(µg/kg)	(µg/kg)
TPH	1,370	100
PCE	10.1	87
TCA	1.80	7,800
Benzene	1.40	44
Toluene	1.48	2,857
Total DDT	219.4	1,600
Chlordane	93	430
Arsenic	7.0	<0.5 to 8.0
Lead	35.0	150
<i>Soil Gas</i>	(µg/m ³)	(µg/m ³)
PCE	1,090	180
TCE	34.4	528
DCE	21.2	15,900
CE	10.9	13
TCA	70.1	991,000
1,4-Dioxane	4,370	2,500
Benzene	24.1	36.2
Toluene	37.6	135,000
Xylenes	11.1	315,000
<i>Groundwater</i>	(µg/l)	(µg/l)
PCE	23.2	5
TCE	4.83	5
DCE	7.79	6

Notes:

RME: Reasonable maximum exposure

PRGs: Preliminary remediation goals





EXPLANATION

Monitoring well location

28.17 Groundwater elevation (feet above Mean Sea Level)

28.0 Groundwater elevation contour (feet above Mean Sea Level). Dashed where inferred

0.004 ft/ft Groundwater flow direction (feet/foot)

441-003-12 Parcel number

Parcel boundary

Property boundary

GROUNDWATER ELEVATIONS March 2006

22958 Saklan Road • Hayward, California

WEST Environmental Services & Technology

Figure 2-1

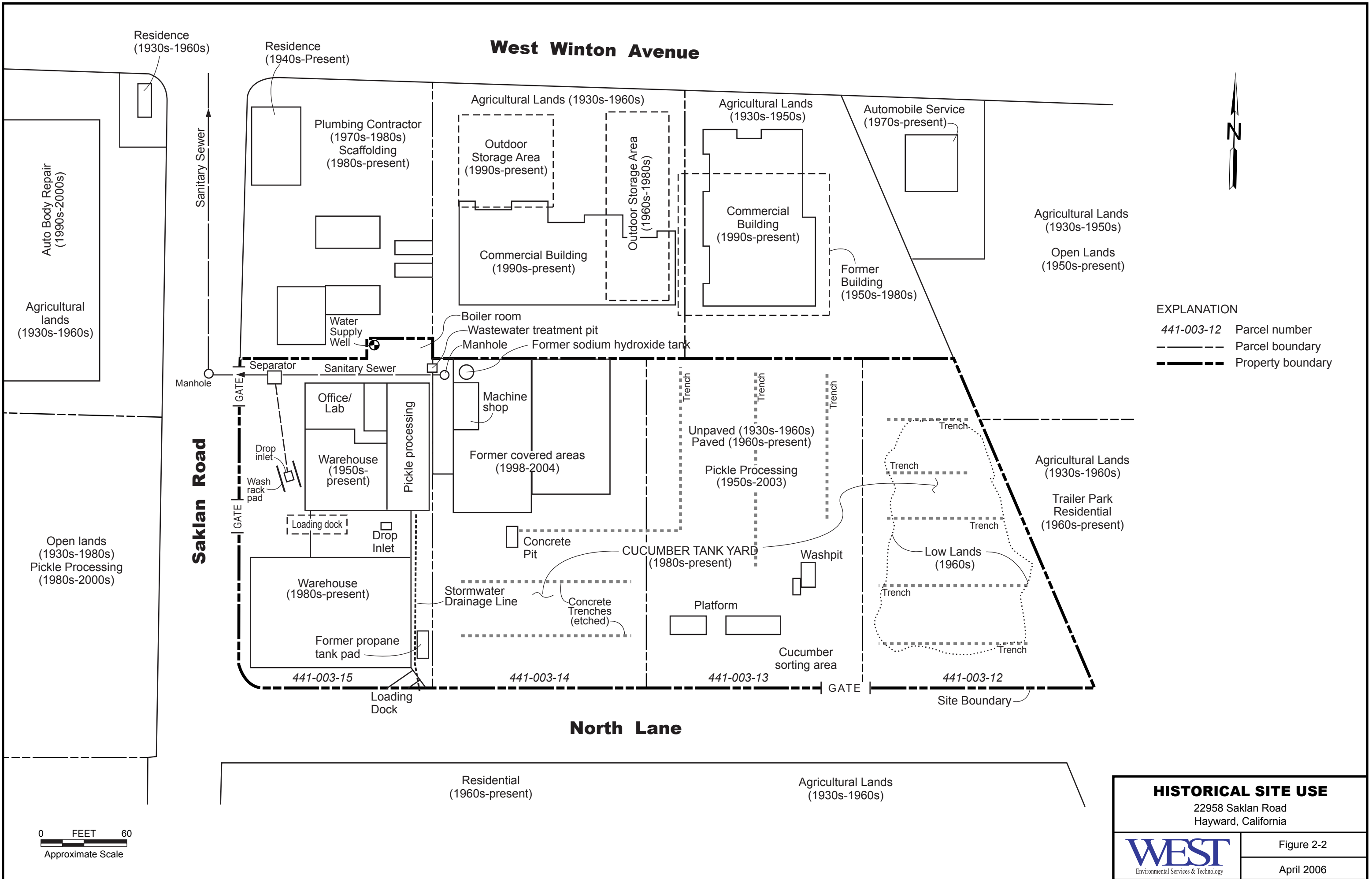
April 2006

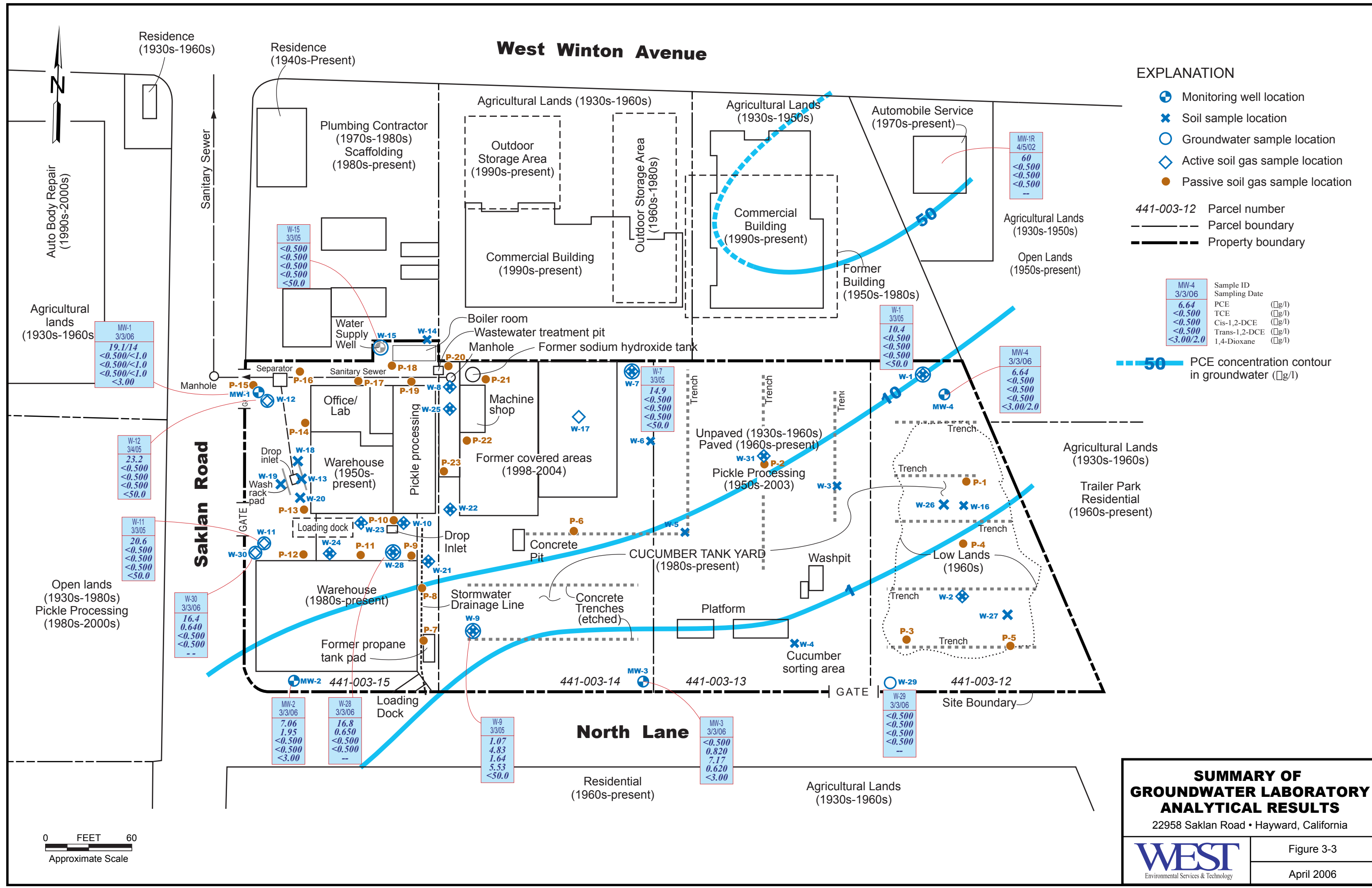
West Winton Avenue

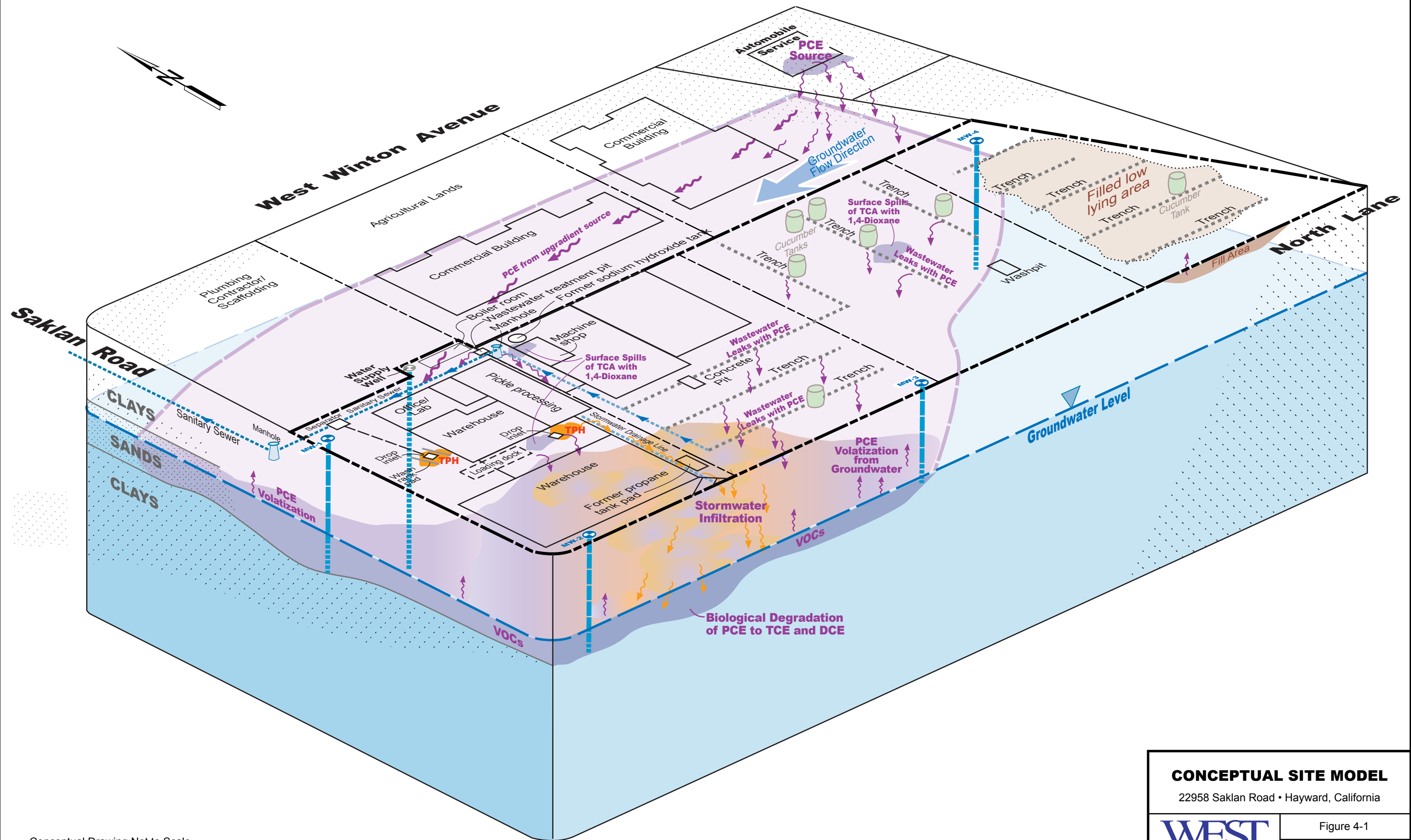


- EXPLANATION**
- 441-003-12 Parcel number
 - Parcel boundary
 - Property boundary


0 FEET 60
Approximate Scale

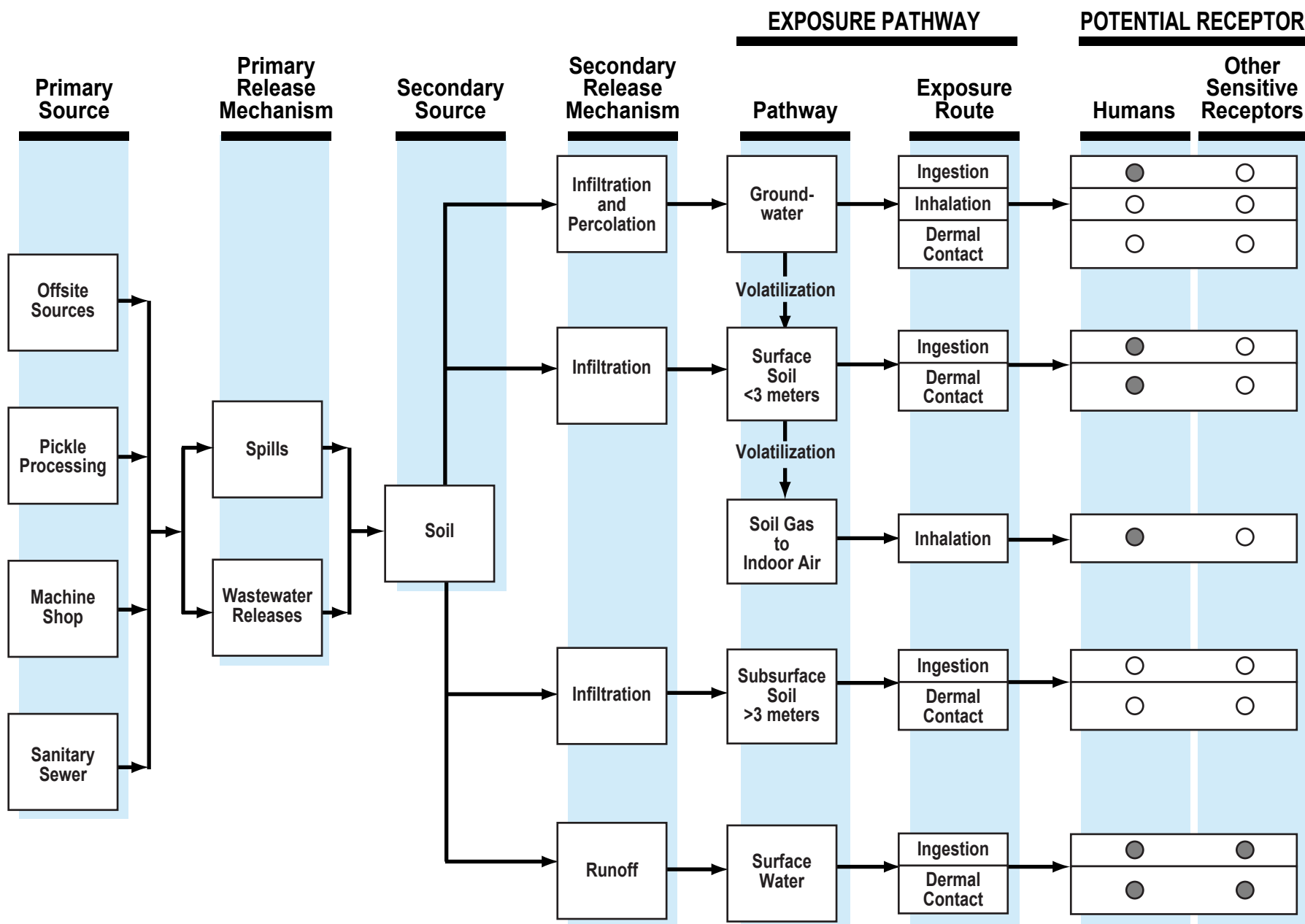






Conceptual Drawing Not to Scale

CONCEPTUAL SITE MODEL 22958 Saklan Road • Hayward, California	
 Environmental Services & Technology	Figure 4-1
	April 2006



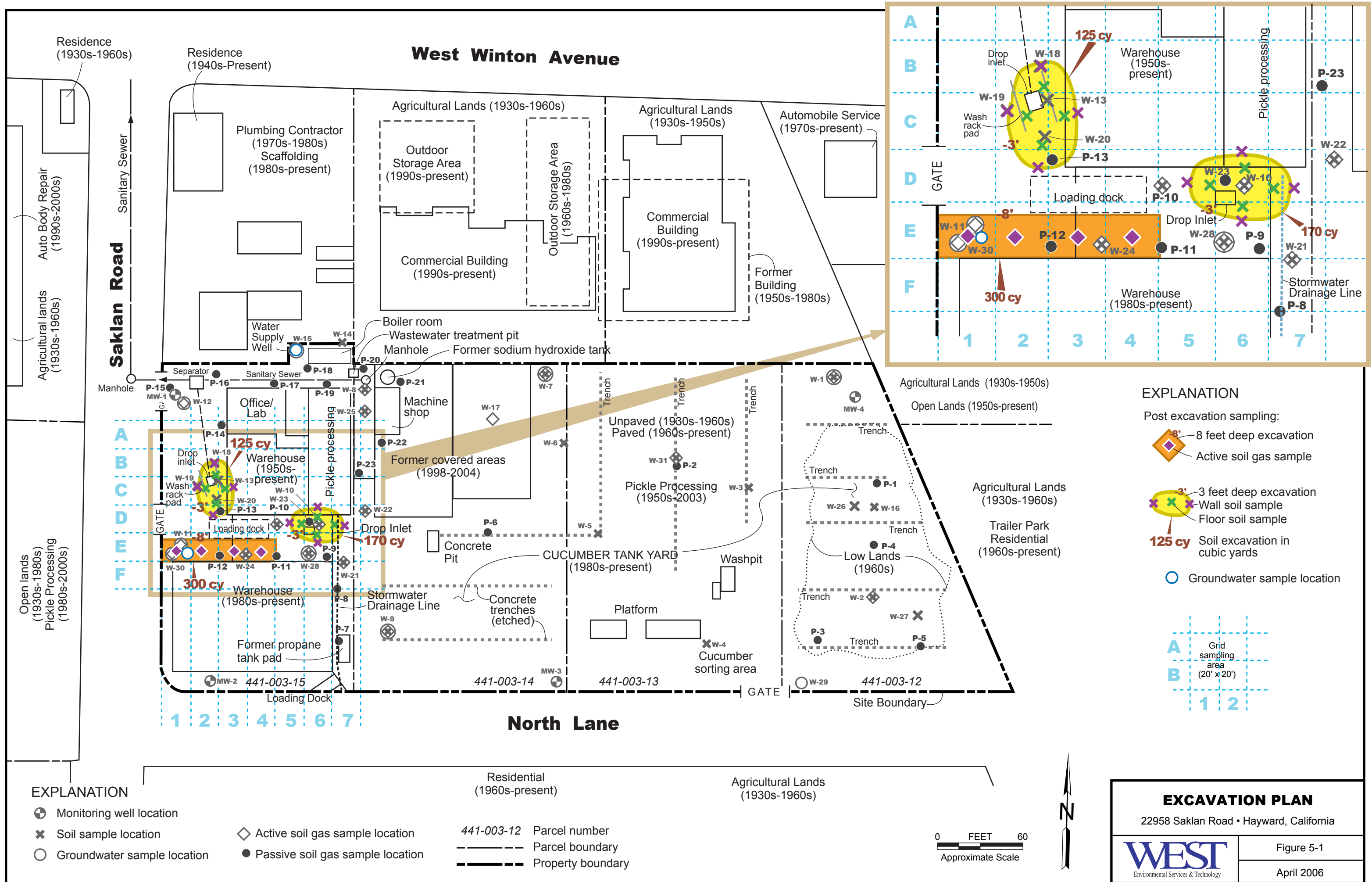
- Incomplete exposure pathway
 ● Complete exposure pathway

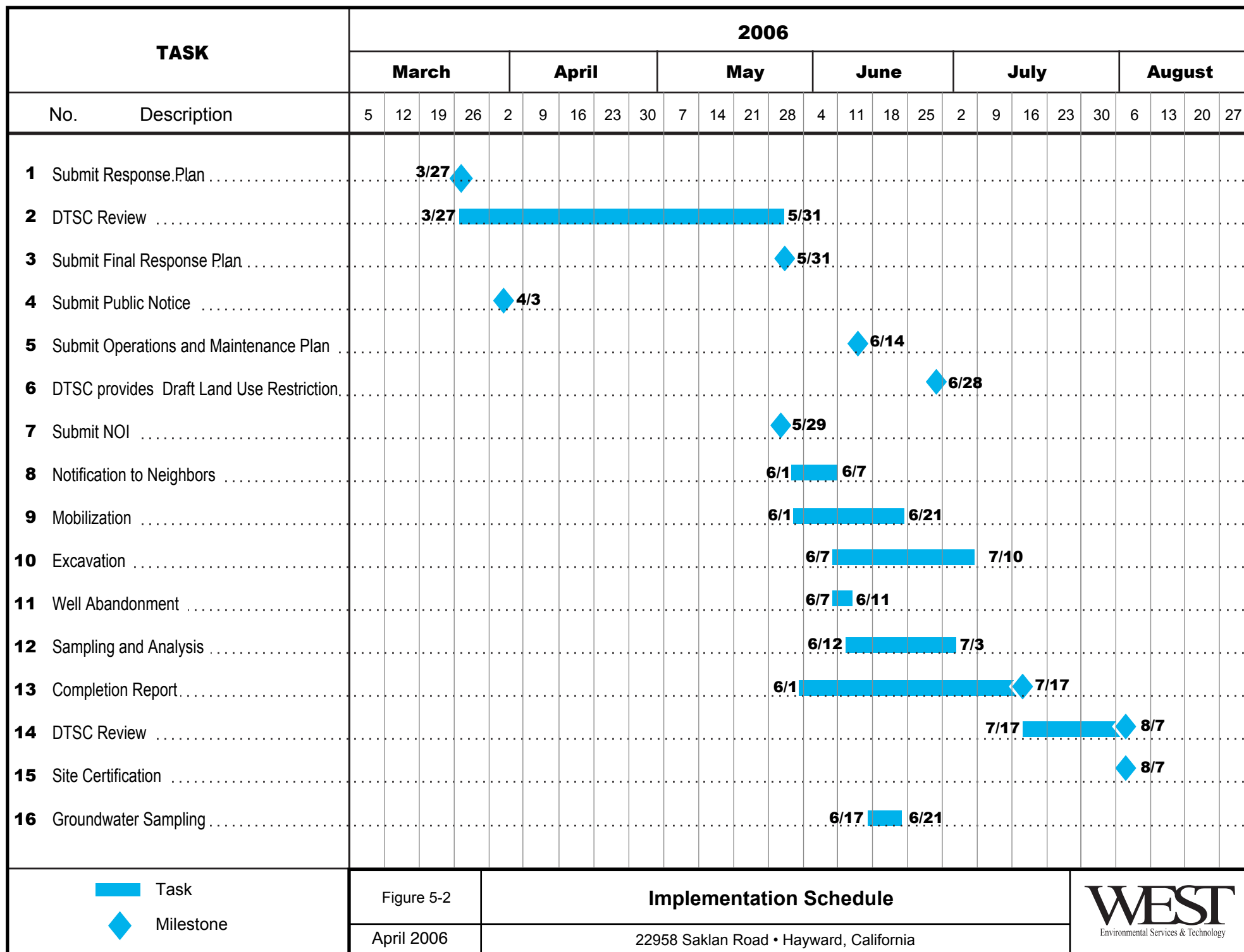
Figure 4-2

CONCEPTUAL SITE MODEL CHART

April 2006

22958 Saklan Road • Hayward, California





APPENDIX A

LABORATORY DATA CERTIFICATES

AND CHAIN-OF-CUSTODY FORMS

REPORT OF FINDINGS AND RESPONSE PLAN
22958 SAKLAN ROAD
HAYWARD, CALIFORNIA



APPENDIX B

SOIL BORING LOGS

APPENDIX C

FIELD DATA FORMS

APPENDIX D

CALCULATIONS

APPENDIX E

SAMPLING AND ANALYSIS PLAN

REPORT OF FINDINGS AND RESPONSE PLAN
22958 SAKLAN ROAD
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APPENDIX F

TRANSPORTATION PLAN